

---

---

# Massachusetts Births 2005

---

---

---

Massachusetts Department of Public Health

Center for Health Information, Statistics, Research, and Evaluation  
Division of Research and Epidemiology

January 2007



---

---

# Massachusetts Births 2005

---

---

Deval L. Patrick, Governor  
Timothy P. Murray, Lieutenant Governor  
JudyAnn Bigby, MD, Secretary of Health and Human Services  
Paul J. Cote, Jr., Commissioner of Public Health

Gerald F. O'Keefe, Director  
Center for Health Information, Statistics, Research, and Evaluation  
Bruce Cohen, Director  
Division of Research and Epidemiology  
Stanley E. Nyberg, Registrar  
Registry of Vital Records and Statistics

Massachusetts Department of Public Health

January 2007

## Acknowledgments

This report was prepared by James K. West, Malena Orejuela Hood, and, Isabel Cáceres of the Division of Research and Epidemiology, Center for Health Information, Statistics, Research, and Evaluation; and Jane Putil, Charlene Zion, and Kevin Foster from the Registry of Vital Records and Statistics.

Special thanks go to: Bruce Cohen, Director, Division of Research and Epidemiology, Center for Health Information, Statistics, Research, and Evaluation; Stanley Nyberg, Registrar, Registry of Vital Records and Statistics; Sharon Pagnano, Maria Vu, Paul Budrow, and Karin Barrett, Registry of Vital Records and Statistics; Saul Franklin and Jamie Wilkins, MassCHIP; Wanda Barfield, Center for Community Health. Support was also provided by Paulette DiMartino, Howard Wong, and Genesis Tan. This report was printed by David Thompson and Ken Lameires of the Copy Center, Central Services Division.

Data in this report have been collected through the efforts of the Registry of Vital Records and Statistics staff, including: Tara Andrews, Irene Chu, Robert Coffin, June Deloney, Carolyn Edwards, Kevin Foster, Haile Gebreegziabher, Annie B. Hobbs, Ramona Irving, Judy Y. Lim, Maureen McKean, Robert McMahan, Venita Morabito, AnnMarie Neault, Denise O'Gara, Jose Otero, Waleska Ortiz, Pauline McNulty, Adele Pascar, Mary Risser, Phyllis Rotman, Mary Lou Rossetti, Monica Smith, Ian Skolnik, and Crystal Steward.

To obtain additional copies of this report, contact:

Massachusetts Department of Public Health  
Center for Health Information,  
Statistics, Research, and Evaluation  
250 Washington Street, 6th floor  
Boston, MA 02108  
or  
Massachusetts Department of Public Health  
Registry of Vital Records and Statistics  
617-740-2670

This and other Department of Public Health publications can be downloaded from the following website:

<http://www.mass.gov/dph/pubstats.htm>

To obtain more information on births in Massachusetts and other Department of Public Health data, register for the Department's free, Internet-based public health information service, MassCHIP, via its website at:

<http://masschip.state.ma.us>

Or call 888-MAS-CHIP (toll free in MA) or 617-624-5629.

## TABLE OF CONTENTS

|   |           |
|---|-----------|
| <b>Note to Readers: Changes in this year's report.....</b>  | <b>9</b>  |
| <b>Highlights .....</b>   | <b>10</b> |
| <b>Introduction .....</b>   | <b>11</b> |
| <b>Methods .....</b>  | <b>11</b> |
| <b>Results .....</b>  | <b>11</b> |
| Table 1. Trends in Birth Characteristics, Massachusetts: 1990, 1991, 1993-2005 .....  | 18        |
| Table 2. Birth Characteristics by Maternal Race and Hispanic Ethnicity and Birthplace, Massachusetts: 2005.....                     | 19        |
| Table 3. Birth Characteristics by Maternal Ancestry, Massachusetts: 2005 .....  | 20        |
| Figure 1. Trends in the Number of Births by Mother's Age Group, Massachusetts: 1980-2005.....                                       | 21        |
| Table 4. Age-Specific and Crude Birth Rates, Massachusetts: 1990 and 2005 .....   | 22        |
| Table 5. Trends in Number and Percent Distribution of Births by Plurality and Age Massachusetts: 1992-2005.....                     | 23        |
| Table 6. Summary of Selected Teen Birth Characteristics, Massachusetts: 2005 .....  | 24        |
| Table 7. Trends in Teen Birth Rates for Selected Communities, Ranked by 2005 Teen Birth Rate, Massachusetts: 1995, 2004, 2005 ..... | 25        |
| Figure 2. Birth Rates Among Women Ages 15-19 by Mother's Race and Hispanic Ethnicity, Massachusetts: 1995-2005.....                 | 26        |
| Table 8. Births by Birthweight, Race and Hispanic Ethnicity, Massachusetts: 2005 .....  | 27        |
| Table 9. Low Birthweight by Plurality, Massachusetts: 1995-2005.....  | 28        |
| Table 10. Births by Gestational Age, Race and Hispanic Ethnicity, Massachusetts: 2005 ....  | 29        |
| Figure 3. Percent of Mothers who Smoked During Pregnancy, Massachusetts: 1990-2005 .  | 30        |
| Figure 4. Percent of Mothers who Smoked During Pregnancy, by Mother's Race/Hispanic Ethnicity, Massachusetts: 2005 .....            | 30        |
| Figure 5. Trends in Adequacy of Prenatal Care by Race and Hispanic Ethnicity, Massachusetts: 1996-2005.....                         | 31        |
| Figure 6. Adequacy of Prenatal Care for Selected Maternal Characteristics, Massachusetts: 2005.....                                 | 32        |

|  |           |
|--|-----------|
| Figure 7. Distribution of Prenatal Care Payment Source, Massachusetts: 2005.....   | 33        |
| Table 11. Trends in Infant, Neonatal, and Post Neonatal Mortality, by Race and Hispanic Ethnicity, Massachusetts: 1990-2005 .....                    | 34        |
| Figure 8. Infant Mortality Rates by Race and Hispanic Ethnicity, Massachusetts: 2005 .....   | 36        |
| Table 12. Resident Birth Characteristics, 30 Largest Municipalities, Massachusetts: 2005...  | 37        |
| Table 13. Birth Characteristics by Licensed Maternity Facility, Massachusetts: 2005 .....  | 39        |
| Table 14. Comparison of Massachusetts Perinatal Health Indicators with Healthy People 2010 Objectives, Massachusetts: 2002-2005.....                 | 41        |
| <b>Appendix.....</b>   | <b>43</b> |
| Table 15. Resident Birth Characteristics, Community Health Network Areas (CHNAs), Massachusetts: 2005.....   | 44        |
| Figure 9. Percent of Mothers Breastfeeding or Intending to Breastfeed by Age Group, Massachusetts: 2005.....   | 46        |
| Figure 10. Percent of Mothers who Smoked During Pregnancy, by Mother's Race/Hispanic Ethnicity and Educational Attainment, Massachusetts: 2005 ..... | 47        |
| Figure 11. Distribution of Smoking Status during Pregnancy by Smoking Status Prior to Pregnancy, Massachusetts: 2005.....                            | 48        |
| Table 16. Parity by Age of Mother, Massachusetts: 2005.....  | 49        |
| Table 17. Selected Birth Characteristics by Maternal Education, Massachusetts: 2005.....   | 50        |
| Table 18. Inter-pregnancy Interval (IPI) and Birth Outcomes. Pregnancies to Multiparous Mothers, Massachusetts: 2005.....                            | 51        |
| Figure 12. Inter-pregnancy Interval (IPI) vs. LBW and Preterm-- Pregnancies to Multiparous Mothers, Massachusetts: 2005.....                         | 52        |
| Table 19. Inter-pregnancy Interval (IPI) by Maternal Characteristics --Pregnancies to Multiparous Mothers, Massachusetts: 2005 .....                 | 53        |
| Figure 13. Inter-pregnancy Interval (IPI) Distribution by Maternal Age -- Pregnancies to Multiparous Mothers, Massachusetts: 2005 .....              | 54        |
| Figure 14. Comparison of Teen vs. Adult Births, Selected Characteristics, Massachusetts: 2005.....   | 55        |
| Figure 15. Trend in Birth Rates Among Women Ages 15-19, Massachusetts and the United States: 1985-2005 .....   | 56        |
| Table 20. Resident Teen Birth Characteristics, 30 Largest Municipalities, Massachusetts: 2005.....   | 57        |

|   |    |
|---|----|
| Table 21. Trends in Infant, Neonatal, and Post Neonatal Mortality, by Race, Massachusetts: 1980-2005.....   | 59 |
| Figure 16. Infant Mortality Rates and 95% Confidence Intervals by Race, Massachusetts: 1980-2005.....   | 62 |
| Figure 17. Infant Mortality Rates, Massachusetts: 1842-2005 .....   | 63 |
| Figure 18. Trends in the Timing of Infant Deaths, Massachusetts: 1990-2005 .....  | 64 |
| Table 22. Feto-Infant Mortality Rate by Birthweight, Massachusetts: 1999-2005 .....   | 65 |
| Figure 19. Feto-Infant Mortality Rate, Massachusetts: 1998-2005.....  | 66 |
| Table 23. Fetal and Infant Deaths by Birthweight and Gestational Age, Massachusetts: 1998-2005.....   | 67 |
| Figure 20. Trends in Pregnancy-Associated and Maternal Mortality, Massachusetts: 1993-2005.....   | 68 |
| Table 24. Number of Pregnancy-Associated and Maternal Mortality, Massachusetts: 1994-2005.....  | 68 |
| Table 25. Low Birthweight (LBW) by Maternal Age, Race and Hispanic Ethnicity, Massachusetts: 2005.....  | 70 |
| Table 26. Adequacy of Prenatal Care Utilization: Summary and Component Indices, Massachusetts: 2005.....  | 71 |
| Table 27. Adequacy of Prenatal Care by Selected Characteristics, Massachusetts: 2005 ....   | 72 |
| Table 28. Adequacy of Prenatal Care Initiation by Selected Characteristics, Massachusetts: 2005.....  | 73 |
| Table 29. Adequacy of Prenatal Care Visits by Selected Characteristics, Massachusetts: 2005.....  | 74 |
| Table 30. Birth Characteristics by Race/Hispanic Ethnicity and Source of Prenatal Care Payment (Public/Private) -- Massachusetts: 2005.....                   | 75 |
| Table 31. Cesarean Section Deliveries and Vaginal Births after Cesarean Section (VBACs) by Licensed Maternity Facility, All Births, Massachusetts: 2005 ..... | 77 |
| Table 32. Cesarean Section Deliveries for Singleton Births by Licensed Maternity Facility and Number of Previous Births, Massachusetts: 2005.....             | 79 |
| Table 33. Birth Characteristics: Occurrence and Resident Births and Infant Deaths, Massachusetts Municipalities: 2005 .....                                   | 81 |
| Table 34. Birth Characteristics: Occurrence and Resident Births and Infant Deaths by County, Massachusetts: 2005 .....  | 89 |

|   |     |
|---|-----|
| Table 35. Birth Characteristics, Occurrence and Resident Births and Infant Deaths,<br>Massachusetts Community Health Network Areas (CHNAs), Massachusetts: 2005 ..... | 90  |
| TECHNICAL NOTES .....   | 91  |
| Tests of Statistical Significance .....   | 99  |
| CONFIDENCE INTERVALS AND INFANT MORTALITY RATES .....   | 100 |
| Table 36. 95% Confidence Intervals for Infant Mortality Rates, by Race and Hispanic<br>Ethnicity, Massachusetts: 1990-2005 .....                                      | 101 |
| Table A1. Population Estimates for Massachusetts Communities: 2005.....   | 105 |
| Table A2. Population Estimates for Massachusetts Community Health Network Areas<br>(CHNA) and Counties: 2005.....   | 108 |
| GLOSSARY .....  | 109 |
| Massachusetts Birth Certificate: 2005 .....   | 114 |
| <i>Massachusetts Births 2005</i> Evaluation Form .....  | 115 |



## **Note to Readers: Changes in this year's report**

This report contains significant changes from previous reports. Please review the information below before reading the report.

1. **New format:** The Report has been revised to follow the National Center for Health Statistics (NCHS) birth report format. The report is divided into five parts: 1) Highlights; 2) Introduction; 3) Methods; 4) Results; and 5) Appendix.
2. **Population changes:** New population estimates are being used for 2000-2005. The new population estimates file, which is referred to as the Massachusetts Department of Public Health Modified Age, Race/Ethnicity, and Sex (MMARS00-05), is based upon estimates produced by the National Center for Health Statistics in collaboration with the Census Bureau's Population Estimation Program. Please note that population-based rates published in this report cannot be compared with those published in previous years, which were based upon the Census 2000 counts. Please see the Appendix for a detailed description of the MMARS00-05 file.
3. **Rate, Proportion, and Number comparisons:** The comparison of rates, proportions, and numbers made in this year's report is based on tests of statistical significance. Comparative words, for example, "higher", "lower", "increase", and "decrease" are used only when the statistics being compared are statistically different (i.e., statistically significant) at the  $P \leq .05$  level. Please see the Appendix for a discussion of how statistical significance is determined.

### **Suggested Citation**

*Massachusetts Births 2005*. Boston, MA: Division of Research and Epidemiology, Center for Health Information, Statistics, Research, and Evaluation, Massachusetts Department of Public Health. January 2007.

## Highlights

- In 2005, the Cesarean section delivery rate for Massachusetts was 32.3%, the highest rate ever reported, continuing an increasing trend since 1997.
- In 2005, 76,824 births occurred to Massachusetts residents, 2% fewer than in the previous year. The number of resident live births in Massachusetts has decreased by 17% since 1990 when it was 92,461 births.
- The Massachusetts teen birth rate in 2005 was 21.7 births per 1,000 women ages 15-19 compared with 22.2 births per 1,000 women ages 15-19 in 2004. The teen birth rate has declined by 16% from 2000 (25.9 births per 1,000 women ages 15-19). Yet, the number of births to young teens (ages 10-14) increased for black non-Hispanic mothers, from 4 in 2004 to 17 in 2005.
- In 2005, the Massachusetts Infant Mortality Rate (IMR) was 5.1 infant deaths per 1,000 live births, compared with 4.8 deaths per 1,000 live births in 2004.
- The percentage of low birthweight (LBW) infants (less than 2,500 grams or 5.5 pounds) remained high, 7.9% compared with 7.8% for 2004, and it has increased by 36% since 1990 when it was 5.8%.
- Births to Laotian and Brazilian mothers have increased by more than 14% since 2004; however, these groups accounted for only 3% of all births in Massachusetts in 2005.
- The percentage of women who reported smoking during pregnancy was 7.2% in 2005, compared with 7.4% in 2004. The percentage of women smoking during pregnancy has decreased 62% since 1990, when it was 19.3%.
- The percentage of mothers who had their prenatal care financed through public programs increased by 7%, from 30.5% in 2004 to 32.6% in 2005. This rate increased by 11% for white non-Hispanic mothers (19.4% in 2004 vs. 21.5% in 2005).
- Disparities in birth outcomes by race, ethnicity, education and community persist:
  - The black non-Hispanic IMR was more than twice as high as the white non-Hispanic IMR (9.4 vs. 4.3 deaths per 1,000 live births).
  - The teen birth rate for Hispanics was almost 6 times that for white non-Hispanics (73.2 vs. 12.9 per 1,000 women ages 15-19).
  - Cambodian (55.1%), Other Central American (65.0%), and Other African (66.9%) mothers were less likely to receive prenatal care in their first trimester compared with mothers in other ethnicity groups (State average: 83.2%).
  - Among the 30 largest Massachusetts municipalities, Brockton (11.5%), Revere (10.9%), New Bedford (10.6%), Springfield (9.8%), and Boston (9.6%) recorded low birthweight percentages that were higher than the statewide average of 7.9%.
  - Mothers with a high school education or less were more likely to smoke during their pregnancies, more likely to deliver low birthweight infants, and less likely to receive adequate prenatal care.

## Introduction

This report presents detailed data on the number and characteristics of Massachusetts births in 2005; maternal behaviors and health characteristics; medical services utilization by pregnant mother; and infant health characteristics. These data are obtained from birth certificates. Birth certificate data are essential for surveillance, research, and development in programs such as universal newborn hearing screening, high risk infant identification and birth defects surveillance. The Registry of Vital Records and Statistics plays a critical role in the collection of birth information: its work provides the basic information that guides many public health initiatives.

## Methods

Data on births are based on information from the Massachusetts Certificate of Live Birth filed with the Registry of Vital Records and Statistics. Medical information such as birthweight and prematurity is based on information supplied by hospitals; demographic and behavioral data such as race and ethnicity, and smoking during pregnancy are supplied by the woman who gave birth. For example, women chose their race from five categories: White, Black, Asian/Pacific Islander, American Indian, and Other. Mothers identified their ancestry by selecting one of 38 ancestry/ethnicity groups<sup>1</sup>.

Vital statistics birth data may be presented in terms of either maternal residence or place of birth. Resident data include all events that occur to residents of the Commonwealth, regardless where they happen. In Massachusetts, a resident is a person with a permanent address in one of the 351 cities or towns. Occurrence data include all events that occur within the state, whether to residents or nonresidents. All data in this publication are for Massachusetts residents unless otherwise stated. There is an exchange agreement among the 50 states, District of Columbia, Puerto Rico, Virgin Islands, Guam, and Canadian provinces that provides for the exchange of copies of birth and death records for women giving birth or dying in a state other than their state of residence.

Starting with this year's publication, new population estimates are used for 2000-2005. In addition, the comparison of rates made in this year's report is based on tests of statistical significance. Comparative words, for example, "higher", "lower", "increase", and "decrease" are used only when the statistics being compared are statistically different at the  $P \leq .05$  level.

## Results

### Number and Rate of Births

In 2005, 76,824 births occurred to Massachusetts residents, 2% fewer than in 2004. Since 1990, the number of births to Massachusetts residents has declined by 17%, and the birth rate among women of reproductive age has declined by 11% (from 62.1 to 55.6 births per 1,000 females ages 15-44) (Table 1).

The number of women over the age of 30 giving birth has risen dramatically since 1980. In 1980, about 1 in 4 Massachusetts births was to a woman age 30 and older while in 2005, almost 3 out of 5 births (55%) was to a woman age 30 and older (Figure 1). The average age of mothers at first birth was 27.9 years in 2005 compared with 28.1 years in 2004.

---

<sup>1</sup> See the "Technical Notes" for a list of ancestries listed in check boxes.

### **Births by Race, Hispanic Ethnicity, and Mother's Birthplace**

The percentage of all Massachusetts resident births to white non-Hispanic mothers has decreased by 11% since 1990, from 78.4% to 69.6%, while the percentage of births to Hispanic mothers increased by 44%, from 9.1% to 13.1% (Table 1).

The percentage of births to non-U.S.-born mothers increased between 2004 and 2005 – from 25.2% to 26.1% (Table 2). The percentage of white non-Hispanic mothers who were non-U.S.-born increased from 11.0% to 11.8%. In 2005, 1 out of 4 births to a Massachusetts resident was to a mother born outside the continental U.S., Puerto Rico, and the U.S. Territories (Table 2).

### **Emerging Populations**

Despite a 2% decrease in the number of births from 2004, certain groups experienced increases in the numbers of births in 2005. Births to Laotian and Brazilian mothers increased by more than 14% since 2004, yet these groups accounted for only 3% of all births in Massachusetts (Table 3). Since 2000, births to Brazilian mothers have increased by 99% and births to Salvadoran mothers by 42%.

### **Patterns in Number and Rate of Births by Age Group**

There has been a marked change in the age distribution of Massachusetts resident mothers since 1980. Approximately 25% of women giving birth in 1980 were age 30 years and older compared with 55% in 2005. Beginning in 1996, the number of births to mothers age 30 years and older exceeded the number of births to mothers under age 30. This trend has continued through 2005 (Figure 1).

Compared with the rates of 1990, birth rates have increased in the age groups over 30 and decreased for age groups under 30. The largest birth rate increase has been for ages 40-44 while the largest decreases have been among the youngest age groups, 15-19 and 10-14. In 2005, there were 59 births to mothers ages 10-14 years (an increase of 17 births from 2004) and there were 188 births to women 45 years of age or older (an increase of 6 births from 2004) (Table 4).

### **Marital Status**

The percentage of mothers who were not married at the time of delivery increased by 6% from 28.5% in 2004 to 30.2% in 2005, continuing the trend of steady increase during the last 15 years (Table 1). Hispanic infants continue to have the highest percentage of unmarried mothers at 64.0%, which was similar to the 2004 figure (Table 2). The percentage of white non-Hispanic mothers who were not married increased by 7%, from 20.1% in 2004 to 21.5% in 2005.

### **Breastfeeding**

The percentage of mothers who were breastfeeding or intending to breastfeed in 2005 was 79.3%, similar to the rate in 2004. This is the first time this rate remained the same after a continuing trend of steady increase in the previous 14 years. The rate of breastfeeding has increased 52% since 1989 when it was 52.2%. Among race and ethnicity groups, Asians had the highest percentage of breastfeeding, 84.9% (Table 2).

### **Multiple Births**

In 2005, 95.4% of births were singletons (73,258), 4.4% were twins (3,375 births), 0.2% were triplets (178 births), and 12 (3 sets) were quadruplets (Table 5). The total percentage of multiple births (twins, triplets or more) was 4.6% in 2005 and 4.8% in 2004. The percentage of multiple births among mothers ages 35 and older was the same as in 2004, 7.5%. The

percentage of multiples among births to mothers ages 35 and older (7.5%) was nearly double the percentage for mothers under age 35 (3.7%).

### **Teen Births**

In 2005, 4,539 births occurred to Massachusetts resident women ages 15-19, which was a difference of 20 fewer births for this age group in 2004 (Table 1). The Massachusetts teen birth rate has decreased yearly from 35.4 births per 1,000 women ages 15-19 in 1990 to the current low of 21.7 in 2005. The Massachusetts teen birth rate in 2005 was 46% below the preliminary U.S. teen birth rate of 40.4 births per 1,000 women ages 15-19.

In 2005, about one-third of teen births were to women ages 15-17 (1,440 births), and two-thirds were to women ages 18-19 (3,099) (Table 6). The annual number of births to young teens (ages 10-14) was 59 in 2005 compared with 42 in 2004. This represents a 62% decline in births in this age group since 1994. In Massachusetts, in 2005, the youngest mothers were ages 12 and 13; 7 births were to mothers age 13, and 1 was to a mother age 12.

In 2005, 47.5% of births to young teens (ages 10-14) were to Hispanic mothers (28 births); 28.8% were to black non-Hispanic mothers (17 births); and 15.3% were to white non-Hispanic mothers (9 births). The birth rate to young teens (ages 10-14) increased for black non-Hispanics, from 0.2 in 2004 to 1.0 live births per females aged 10-14 years in 2005. The 2005 birth rate for younger teens was 0.3 live births per 1,000 females ages 10-14 years, which was 57% below the U.S. birth rate for young teens (0.7).

In 2005, birth rates among resident teen women had the same rank order from highest to lowest by race and Hispanic ethnicity as they had in 1995 (Hispanic and black non-Hispanic women had the highest teen birth rates, while Asian and white non-Hispanic women had the lowest), and they have decreased for all groups compared with 1995 rates (Figure 2). In 2005, the teen birth rate for Hispanics was almost 6 times that for white non-Hispanics (73.2 vs. 12.9 per 1,000 women ages 15-19). There were no significant changes in teen birth rates by race and ethnicity from 2004, but all rates, except for Asian mothers, have declined since 2000.

Among Massachusetts municipalities with the highest number of teen births, teen birth rates were highest in Holyoke (96.8), Chelsea (75.0), Lawrence (71.7), and Springfield (71.6). These communities had rates over 3 times the statewide rate of 21.7 teen births per 1,000 females 15-19 (Table 7).

### **Low Birthweight (LBW)**

The percentage of low birthweight infants (less than 2,500 grams or 5.5 pounds) was 7.9% in 2005 and 7.8% in 2004. The percentage of low birthweight infants has increased by 36% since 1990 when it was 5.8% (Table 8).

Black non-Hispanic infants continue to have the highest percentage of LBW at 12.0%, followed by Hispanics at 8.2% (Table 8). There were no significant changes from 2004 to 2005 in LBW percentages by race and ethnicity. The percentage of very low birthweight (VLBW; infants weighing less than 3.3 pounds) was 1.4% in 2005 compared with 1.5% in 2004. Black non-Hispanic infants continue to have the highest percentage of VLBW at 2.9% (Table 8).

The increase in low birthweight in Massachusetts over the past decade can be attributed in part to the increase in multiple births in Massachusetts. The percentage of low birthweight (LBW) and very low birthweight (VLBW) rises for twins and higher order births. In 2004, 5% of singleton births were LBW, whereas 53% of twins and 95% of higher order births were LBW (Table 9).

### **Preterm Deliveries**

The percentage of preterm infants (infants delivered before the 37<sup>th</sup> week of gestation) was 9.0% in 2005 and 9.2% in 2004 (Table 1). Black non-Hispanic mothers continue to have the highest percentage of preterm infants at 12.4% followed by Hispanics at 9.1%. There were no significant changes from 2004 to 2005 in the percentage of preterm infants by race and ethnicity.

The percentage of infants delivered very early (before the 28<sup>th</sup> week of gestation) has remained the same since 1997 at 0.6%. Black non-Hispanic women had the highest proportion of infants delivered very early, 1.7%, which was more than double that of any other race group (Table 10).

### **Smoking**

The percentage of women who reported smoking during pregnancy was 7.2 in 2005 compared with 7.4% in 2004 and has declined by 62% since 1990 (19.3%) (Figure 3). White non-Hispanic mothers continued to have the highest percentage of smoking during pregnancy at 8.4% followed by black non-Hispanics at 6.1% (Figure 4). There were no significant changes in the percentage of mothers who reported smoking during pregnancy from 2004 to 2005 by race and ethnicity.

### **Prenatal Care**

Adequacy of prenatal care was 84.0% in 2005 and 84.2% in 2004 (Table 1). Adequacy of prenatal care is a measure of the timing and number of prenatal care visits, not an assessment of the quality of prenatal care. [Please note: these data are not comparable to data published in reports prior to 2001. Beginning with the 2001 report, the Adequacy of Prenatal Care Utilization (APNCU) Index is used to measure adequacy of prenatal care, replacing the Kessner Index].

The percentage of adequate prenatal care varied by mother's race and Hispanic ethnicity, ranging from a low of 75.8% for Hispanic mothers to a high of 86.8% for white non-Hispanic mothers. The rates for black non-Hispanic and Asian mothers were 76.3% and 81.6%, respectively (Figure 5).

Less educated mothers (less than High school) were less likely to receive adequate prenatal care, 71.0%, compared with 90.2% for mothers with a college degree or higher (Figure 6). Younger teens (ages 17 or younger) were less likely to receive adequate prenatal care than mothers ages 35 and older, 66.2% compared to 88.2%.

### **Publicly Financed and Privately Insured Prenatal Care**

Maternal and birth characteristics varied according to whether prenatal care was financed through public programs or through private insurance. The percentage of mothers who had their prenatal care financed through public programs increased in 2005 by 7% from 2004, from 30.5% in 2004 to 32.6% in 2005 (Figure 7). Among white non-Hispanic mothers, this rate increased by 11% from 2004. Hispanic mothers continue to have the highest percentage of deliveries financed by public funds at 72.3%.

Overall in Massachusetts, approximately 1 in 5 mothers (24.2%) had her prenatal care financed by Medicaid/MassHealth. However, Medicaid/MassHealth financing varied largely by race and Hispanic ethnicity. About half of Hispanic and black non-Hispanic mothers had their PNC financed by Medicaid/MassHealth; whereas, 19.6% of Asian and 17.0% of white non-Hispanic mothers' PNC was Medicaid/MassHealth financed (Table 30).

## **Cesarean Sections**

In 2005, the Cesarean section delivery rate rose for the sixth straight year to an all time high of 32.3%. The 2005 Cesarean section delivery rate is a 4% increase over the 2004 percentage (31.0%), which also was an all time high (Table 1). The Cesarean section rate in Massachusetts in 2005 was 7% higher than the nationwide rate of 30.2%. The nationwide rate for 2005 was also the highest ever recorded.

The percentage of Cesarean sections increased by 5% for white non-Hispanic mothers. Black non-Hispanic women had the highest percentage of Cesarean section deliveries (33.7%)<sup>2</sup>. Hispanic and Asian women had the lowest percentages (27.1% and 28.9%, respectively). With regard to maternal ancestry groups, the highest percentage of Cesarean section deliveries occurred to Brazilian women (40.6%), and the lowest percentage was among Cambodian women (15.9%) (Table 3).

## **Infant Mortality Rate (IMR)**

In 2005, there were 391 infant deaths (deaths of children less than one year of age) among Massachusetts residents, 15 more infant deaths than in 2004 (Table 11). The infant mortality rate was 5.1 deaths per 1,000 live births in 2005, compared with 4.8 deaths per 1,000 live births in 2004. The infant mortality rate has decreased by 27% since 1990, from 7.0 deaths per 1,000 live births to 5.1 deaths per 1,000 live births.

Although the IMR for black non-Hispanics went from 11.5 to 9.4 from 2004 to 2005, black non-Hispanics continued to have the highest IMR among race and ethnicity groups (Figure 8). The white non-Hispanic IMR went from 3.8 in 2004 to 4.3 in 2005, and the IMR for Asians went from 2.7 in 2004 to 3.4 infant deaths per 1,000 live births in 2005. The Hispanic IMR went from 7.6 in 2004 to 7.7 in 2005. None of these changes were statistically significant (for Confidence Intervals, please see Table 36).

## **Birth Characteristics in the 30 Largest Massachusetts Cities and Towns**

In 2005, among live births to residents of the 30 largest municipalities in the Commonwealth (Table 12):

- Five communities recorded low birthweight percentages that were higher than the statewide average of 7.9%: Brockton (11.5%), Revere (10.9%), New Bedford (10.6%), Springfield (9.8%), and Boston (9.6%). Leominster (5.5%) had a lower percentage of low birthweight infants than the statewide average.
- At least 90% of mothers living in Brookline and Cambridge received adequate prenatal care. In contrast, fewer than 70% of mothers living in Pittsfield (61.0%) and Lowell (68.2%) received adequate prenatal care.
- Among the largest municipalities, two communities had 2005 infant mortality rates (IMR) higher than the state IMR of 5.1 per 1,000 live births: Springfield (10.6) and Worcester (13.9 deaths per 1,000 live births).
- Based on a three-year infant mortality rate (IMR) from 2003-2005, which is more stable than a one-year rate, Worcester (8.2, 95% CI: 6.2-10.3) had the highest IMR. The difference in

---

<sup>2</sup> Note that the category of black non-Hispanic mothers includes mothers who identified with several ancestries including Haitian, African American and Other African. Mothers who identified as African American for their ancestry had a Cesarean section rate of 30.9% and Haitian mothers had a Cesarean section rate of 36.7%.

IMR for Springfield approached statistical significance (7.1, 95% CI: 5.2-9.0) compared with the state (4.9, 95% CI: 4.6-5.2) (For a discussion of CI, please see Appendix).

### **Birth Characteristics by Facility**

Listed below are facilities that in 2005 had the 3 highest and 3 lowest rates for cesarean deliveries, low birthweight infants, publicly funded deliveries, and deliveries with adequate prenatal care (Table 13).

#### Cesarean section (state rate 32.5%)

Highest percentages in:

|   |       |
|---|-------|
| Beth Israel Deaconess Medical Center            | 42.4% |
| Caritas Holy Family Hospital and Medical Center | 41.2% |
| Melrose-Wakefield Hospital                      | 41.0% |

Lowest percentages in:

|                           |       |
|---------------------------|-------|
| Tobey Hospital            | 18.1% |
| Holyoke Hospital          | 20.3% |
| Heywood Memorial Hospital | 21.6% |

#### Low Birthweight (LBW) (state rate 7.9%)

Highest percentages in:

|  |       |
|--|-------|
| Tufts-New England Medical Center Hospital        | 27.3% |
| Caritas St. Elizabeth's Medical Center of Boston | 15.0% |
| Baystate Medical Center                          | 12.8% |

Lowest percentages in:

|                     |      |
|---------------------|------|
| Cambridge Hospital  | 2.0% |
| Tobey Hospital      | 3.0% |
| Leominster Hospital | 3.1% |

#### Publicly Funded Delivery (state rate 31.8%)

Highest percentages in:

|                       |       |
|-----------------------|-------|
| Boston Medical Center | 83.3% |
| Cambridge Hospital    | 73.2% |
| Holyoke Hospital      | 66.6% |

Lowest percentages in:

|                           |      |
|---------------------------|------|
| Newton Wellesley Hospital | 2.7% |
| Winchester Hospital       | 5.7% |
| Emerson Hospital          | 6.2% |

#### Adequacy of Prenatal Care by Facility (state rate 84.1%)

Lowest percentages in:

|                                       |       |
|---------------------------------------|-------|
| Boston Medical Center                 | 54.0% |
| Caritas Good Samaritan Medical Center | 57.6% |
| Berkshire Medical Center              | 62.8% |



Highest percentages in:

|                                      |       |
|--------------------------------------|-------|
| Brigham and Women's Hospital         | 97.5% |
| Beth Israel Deaconess Medical Center | 95.3% |
| Saint Vincent Hospital               | 94.3% |

### **Healthy People 2010 Objectives**

Healthy People 2010 (HP2010) sets targets for each measurable Healthy People objective<sup>3</sup>. Table 6 presents the most recent Massachusetts data for HP2010 Maternal, Infant, and Child Health objectives and measures the state's progress toward meeting the targets set for 2010.

Out of 16 objectives presented, Massachusetts has already met the 2010 target for breastfeeding (Table 14). For eight objectives, the 2005 Massachusetts indicators are within 25% of the 2010 target goals: perinatal mortality, infant mortality rate, postneonatal mortality rate, preterm birth, early and adequate prenatal care, prenatal care beginning in the first trimester, very low birthweight infants born at Level III hospitals, and smoking during pregnancy. For seven objectives, Massachusetts is still more than 25% away from achieving the 2010 targets: fetal mortality rate, neonatal mortality rate, maternal mortality ratio, low birthweight, very low birthweight, and Cesarean sections (both low-risk women giving birth for the first time and for low-risk women with prior Cesarean sections).

### **A Comparison of Massachusetts and U.S. Indicators**

According to preliminary U.S. birth statistics for 2005<sup>4</sup>, the following Massachusetts perinatal health indicators in 2005 were better than those for the U.S.:

- The teen birth rate in Massachusetts (21.7 births per 1,000 women ages 15-19) was 46% lower than the U.S. teen birth rate (40.4 births per 1,000 women ages 15-19).
- The percentage of unmarried mothers in Massachusetts (30.2%) was 18% lower than the U.S. percent (36.8%).
- The low birthweight rate in Massachusetts (7.9%) was 4% lower than the U.S. low birthweight rate (8.2%).
- The preterm rate in Massachusetts (9.0%) was 29% lower than the U.S. preterm rate (12.7%).

The Cesarean section delivery rate in Massachusetts (32.3%) was 7% higher than the U.S. Cesarean section rate (30.2%).

---

<sup>3</sup> U.S. Department of Health and Human Services. Tracking Healthy People 2010. Washington, DC: U.S. Government Printing Office, November 2000.

<sup>4</sup> National Center for Health Statistics. Births: Preliminary Data for 2005. Released November 22, 2006.

Table 1. Trends in Birth Characteristics, Massachusetts: 1990, 1991, 1993-2005

| Characteristic                              |                          | 1990   | 1991   | 1993   | 1994   | 1995   | 1996   | 1997   | 1998   | 1999   | 2000   | 2001   | 2002   | 2003   | 2004   | 2005   |
|---|--------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Births <sup>1</sup>                         | n <sup>2</sup>           | 92,461 | 88,176 | 84,627 | 83,758 | 81,562 | 80,164 | 80,321 | 81,406 | 80,866 | 81,582 | 81,014 | 80,624 | 80,167 | 78,460 | 76,824 |
|   | Rate <sup>3</sup>        | 62.1   | 59.4   | 57.6   | 57.0   | 55.5   | 54.6   | 54.7   | 55.6   | 55.9   | 57.1   | 56.6   | 56.8   | 56.8   | 56.2   | 55.6   |
| Race of Mother                              |                          |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
| White non-Hispanic                          | n                        | 72,483 | 68,619 | 65,487 | 64,589 | 63,043 | 61,829 | 61,204 | 61,764 | 60,402 | 60,051 | 59,115 | 58,136 | 57,604 | 55,322 | 53,469 |
|   | % <sup>4</sup>           | 78.4   | 77.8   | 77.4   | 77.1   | 77.3   | 77.1   | 76.2   | 75.9   | 74.7   | 73.6   | 73.0   | 72.1   | 71.9   | 70.5   | 69.6   |
| Black non-Hispanic                          | n                        | 7,158  | 6,737  | 6,419  | 6,262  | 5,858  | 5,491  | 5,482  | 5,549  | 5,844  | 5,755  | 5,862  | 5,948  | 5,902  | 6,053  | 6,077  |
|   | % <sup>4</sup>           | 7.7    | 7.6    | 7.6    | 7.5    | 7.2    | 6.9    | 6.8    | 6.8    | 7.2    | 7.1    | 7.2    | 7.4    | 7.4    | 7.7    | 7.9    |
| Asian                                       | n                        | 3,349  | 3,218  | 3,267  | 3,325  | 3,355  | 3,398  | 3,719  | 3,748  | 4,138  | 4,667  | 4,784  | 5,300  | 5,224  | 5,454  | 5,251  |
|   | % <sup>4</sup>           | 3.6    | 3.7    | 3.9    | 4.0    | 4.1    | 4.2    | 4.6    | 4.6    | 5.2    | 5.7    | 5.9    | 6.6    | 6.5    | 7.0    | 6.8    |
| Hispanic                                    | n                        | 8,406  | 8,477  | 8,250  | 8,429  | 8,077  | 7,756  | 8,211  | 8,665  | 8,815  | 9,247  | 9,410  | 9,543  | 9,764  | 9,798  | 10,061 |
|   | % <sup>4</sup>           | 9.1    | 9.6    | 9.8    | 10.1   | 9.9    | 9.7    | 10.2   | 10.6   | 10.9   | 11.3   | 11.6   | 11.8   | 12.2   | 12.5   | 13.1   |
| Teen Births<br>(Ages 15-19)                 | n                        | 7,258  | 6,892  | 6,469  | 6,412  | 5,990  | 5,758  | 5,801  | 5,823  | 5,515  | 5,305  | 4,979  | 4,642  | 4,639  | 4,559  | 4,539  |
|   | Rate <sup>3</sup>        | 35.4   | 35.4   | 34.0   | 33.2   | 30.3   | 28.5   | 28.5   | 28.1   | 26.7   | 25.9   | 24.9   | 23.3   | 23.0   | 22.2   | 21.7   |
| Births to Unmarried<br>Mothers <sup>5</sup> | n                        | 22,837 | 22,852 | 22,345 | 22,302 | 20,857 | 20,253 | 20,640 | 21,191 | 21,448 | 21,621 | 21,620 | 21,604 | 22,262 | 22,376 | 23,170 |
|   | %                        | 24.7   | 25.9   | 26.4   | 26.6   | 25.6   | 25.3   | 25.7   | 26.0   | 26.5   | 26.5   | 26.7   | 26.8   | 27.8   | 28.5   | 30.2   |
| C-section                                   | n                        | 20,615 | 19,495 | 18,146 | 17,289 | 16,758 | 15,675 | 15,742 | 16,975 | 18,080 | 19,086 | 20,639 | 22,553 | 23,392 | 24,295 | 24,732 |
|   | %                        | 22.3   | 22.1   | 21.4   | 20.6   | 20.6   | 19.6   | 19.6   | 20.9   | 22.4   | 23.4   | 25.5   | 28.0   | 29.2   | 31.0   | 32.3   |
| Low<br>Birthweight                          | n                        | 5,388  | 5,199  | 5,202  | 5,335  | 5,174  | 5,105  | 5,617  | 5,655  | 5,708  | 5,711  | 5,795  | 6,060  | 6,115  | 6,125  | 6,073  |
|   | %                        | 5.8    | 5.9    | 6.2    | 6.4    | 6.4    | 6.4    | 7.0    | 7.0    | 7.1    | 7.1    | 7.2    | 7.5    | 7.6    | 7.8    | 7.9    |
| Preterm                                     | n                        | 5,899  | 6,492  | 6,201  | 6,492  | 6,438  | 5,705  | 5,831  | 6,117  | 6,136  | 6,582  | 6,412  | 6,795  | 6,963  | 7,222  | 6,925  |
|   | %                        | 6.5    | 7.8    | 7.4    | 7.8    | 7.9    | 7.2    | 7.3    | 7.6    | 7.6    | 8.3    | 8.0    | 8.5    | 8.7    | 9.2    | 9.0    |
| Adequate Prenatal Care                      |                          |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
| Kessner Index <sup>6</sup>                  | %                        | 80.1   | 81.6   | 83.8   | 84.3   | 84.2   | 79.9   | 80.0   | 79.8   | 79.4   | 79.1   | 80.4   | 79.9   | 79.9   | 79.5   | 78.9   |
|   | APNCU Index <sup>7</sup> |        |        |        |        |        | 83.3   | 82.9   | 82.9   | 82.9   | 83.3   | 85.2   | 84.7   | 84.5   | 84.2   | 84.0   |

NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.

1. Births presented in all tables are resident live births unless otherwise specified. 2. Differences in numbers of births from previous publications are the result of updated files. 3. Birth rates represent the total number of births to women ages 15-44 years per 1,000 females ages 15-44; teen birth rates refer to number of births per 1,000 women age 15-19. 2000-2005 birth rates are calculated Massachusetts (Department of Public Health) Modified Age, Race/Ethnicity, & Sex Estimates 2000-2005 (MMARS00-05), released October, 2006. 1999 rates are calculated using the 1999 DPH Massachusetts population estimates (see Technical Notes in Appendix). PLEASE NOTE: DIFFERENCES BETWEEN THESE RATES AND PREVIOUSLY PUBLISHED DATA REFLECT UPDATES IN POPULATION ESTIMATES. 4. Percentages are calculated based on births, including those to mothers of unknown race. 5. Includes those women who were unmarried 300 days before giving birth. 6. Adequacy of prenatal care in Massachusetts has historically been measured with the Kessner Index, based on the timing of care and number of visits. This measure is calculated based on only those births with known adequacy of prenatal care. Changes in the calculation of the Kessner Index in 1996, as well as computational adjustments made for 1996-2000 data, make data prior to 1996 non-comparable to data from 1996 onward. 7. Beginning with *Births 2001*, the APNCU Index has replaced the Kessner Index as the standard measurement of adequacy of prenatal care (see Technical Notes in Appendix for more information).

**Table 2. Birth Characteristics by Maternal Race and Hispanic Ethnicity and Birthplace, Massachusetts: 2005**

| Race and Hispanic<br>Ethnicity (by<br>mother's birthplace) | Births          |                 | Teen Births     |                 |                 |                 | Birthweight           |                 |                  |                 | Prenatal Care         |                 |                 |                 | Cesarean<br>Section |                 | Breastfeeding <sup>5</sup> |                 |
|--|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------------|-----------------|------------------|-----------------|-----------------------|-----------------|-----------------|-----------------|---------------------|-----------------|----------------------------|-----------------|
|  |                 |                 | <18 Years       |                 | <20 Years       |                 | Very Low <sup>2</sup> |                 | Low <sup>3</sup> |                 | Adequate <sup>4</sup> |                 | First Trimester |                 |                     |                 |                            |                 |
|  | n               | % <sup>1</sup>  | n               | %               | n               | %               | n                     | %               | n                | %               | n                     | %               | n               | %               | n                   | %               | n                          | %               |
| <b>State Total</b>   | <b>76,824</b>   | <b>100.0</b>    | <b>1,499</b>    | <b>2.0</b>      | <b>4,598</b>    | <b>6.0</b>      | <b>1,098</b>          | <b>1.4</b>      | <b>6,073</b>     | <b>7.9</b>      | <b>63,748</b>         | <b>84.0</b>     | <b>63,410</b>   | <b>83.2</b>     | <b>24,732</b>       | <b>32.3</b>     | <b>59,845</b>              | <b>79.3</b>     |
| U.S. States / D.C.   | 54,752          | 71.3            | 1,140           | 2.1             | 3,504           | 6.4             | 785                   | 1.4             | 4,392            | 8.0             | 46,442                | 85.8            | 46,574          | 85.6            | 17,943              | 32.9            | 40,546                     | 75.7            |
| Puerto Rico/U.S. Terr. <sup>7</sup>                        | 2,018           | 2.6             | 164             | 8.1             | 385             | 19.1            | 44                    | 2.2             | 206              | 10.2            | 1,527                 | 77.2            | 1,522           | 76.1            | 545                 | 27.1            | 1,483                      | 74.3            |
| Non-U.S.-Born <sup>8</sup>                                 | 20,044          | 26.1            | 194             | 1.0             | 707             | 3.5             | 268                   | 1.3             | 1,472            | 7.4             | 15,774                | 79.8            | 15,310          | 77.2            | 6,239               | 31.2            | 17,812                     | 89.6            |
| <b>White non-Hispanic</b>                                  | <b>53,469</b>   | <b>69.6</b>     | <b>546</b>      | <b>1.0</b>      | <b>2,081</b>    | <b>3.9</b>      | <b>653</b>            | <b>1.2</b>      | <b>3,896</b>     | <b>7.3</b>      | <b>46,012</b>         | <b>86.8</b>     | <b>46,129</b>   | <b>86.7</b>     | <b>17,861</b>       | <b>33.5</b>     | <b>40,890</b>              | <b>78.1</b>     |
| U.S. States / D.C.   | 47,050          | 88.0            | 511             | 1.1             | 1,919           | 4.1             | 589                   | 1.3             | 3,501            | 7.4             | 40,650                | 87.1            | 40,876          | 87.3            | 15,822              | 33.8            | 35,134                     | 76.4            |
| Puerto Rico/U.S. Terr. <sup>7</sup>                        | 79              | 0.1             | -- <sup>6</sup> | -- <sup>6</sup> | 13              | 16.5            | -- <sup>6</sup>       | -- <sup>6</sup> | 8                | 10.1            | 62                    | 79.5            | 73              | 92.4            | 21                  | 26.6            | 68                         | 88.3            |
| Non-U.S.-Born <sup>8</sup>                                 | 6,335           | 11.8            | 33              | 0.5             | 149             | 2.4             | 64                    | 1.0             | 386              | 6.1             | 5,298                 | 84.2            | 5,178           | 82.1            | 2,016               | 31.9            | 5,686                      | 90.8            |
| <b>Black non-Hispanic</b>                                  | <b>6,077</b>    | <b>7.9</b>      | <b>207</b>      | <b>3.4</b>      | <b>604</b>      | <b>9.9</b>      | <b>177</b>            | <b>2.9</b>      | <b>731</b>       | <b>12.0</b>     | <b>4,463</b>          | <b>76.3</b>     | <b>4,258</b>    | <b>72.0</b>     | <b>2,037</b>        | <b>33.7</b>     | <b>4,851</b>               | <b>80.5</b>     |
| U.S. States / D.C.   | 3,094           | 50.9            | 177             | 5.7             | 513             | 16.6            | 102                   | 3.3             | 426              | 13.8            | 2,292                 | 76.7            | 2,235           | 73.8            | 959                 | 31.3            | 2,168                      | 70.9            |
| Puerto Rico/U.S. Terr. <sup>7</sup>                        | 14              | 0.2             | -- <sup>6</sup> | -- <sup>6</sup> | -- <sup>6</sup> | -- <sup>6</sup> | -- <sup>6</sup>       | -- <sup>6</sup> | -- <sup>6</sup>  | -- <sup>6</sup> | 10                    | 76.9            | 11              | 78.6            | 7                   | 50.0            | 11                         | 78.6            |
| Non-U.S.-Born <sup>8</sup>                                 | 2,967           | 48.8            | 30              | 1.0             | 91              | 3.1             | 74                    | 2.5             | 302              | 10.2            | 2,159                 | 75.8            | 2,011           | 70.0            | 1,070               | 36.1            | 2,671                      | 90.4            |
| <b>Hispanic</b>  | <b>10,061</b>   | <b>13.1</b>     | <b>608</b>      | <b>6.0</b>      | <b>1,551</b>    | <b>15.4</b>     | <b>160</b>            | <b>1.6</b>      | <b>828</b>       | <b>8.2</b>      | <b>7,512</b>          | <b>75.8</b>     | <b>7,428</b>    | <b>74.5</b>     | <b>2,713</b>        | <b>27.1</b>     | <b>8,088</b>               | <b>80.8</b>     |
| U.S. States / D.C.   | 3,185           | 31.7            | 352             | 11.1            | 822             | 25.8            | 59                    | 1.9             | 319              | 10.0            | 2,395                 | 76.5            | 2,389           | 75.9            | 795                 | 25.1            | 2,166                      | 68.5            |
| Puerto Rico/U.S. Terr. <sup>7</sup>                        | 1,911           | 19.0            | 160             | 8.4             | 369             | 19.3            | 40                    | 2.1             | 191              | 10.0            | 1,441                 | 76.9            | 1,427           | 75.3            | 514                 | 27.0            | 1,398                      | 73.6            |
| Non-U.S.-Born <sup>8</sup>                                 | 4,964           | 49.3            | 96              | 1.9             | 359             | 7.2             | 61                    | 1.2             | 318              | 6.4             | 3,675                 | 74.9            | 3,611           | 73.4            | 1,403               | 28.3            | 4,523                      | 91.3            |
| <b>Asian</b>   | <b>5,251</b>    | <b>6.8</b>      | <b>66</b>       | <b>1.3</b>      | <b>163</b>      | <b>3.1</b>      | <b>47</b>             | <b>0.9</b>      | <b>409</b>       | <b>7.8</b>      | <b>4,259</b>          | <b>81.6</b>     | <b>4,116</b>    | <b>78.7</b>     | <b>1,515</b>        | <b>28.9</b>     | <b>4,447</b>               | <b>84.9</b>     |
| U.S. States / D.C.   | 592             | 11.3            | 49              | 8.3             | 116             | 19.6            | 10                    | 1.7             | 53               | 9.0             | 456                   | 77.3            | 432             | 73.2            | 139                 | 23.5            | 483                        | 82.0            |
| Puerto Rico/U.S. Terr. <sup>7</sup>                        | -- <sup>6</sup> | -- <sup>6</sup> | -- <sup>6</sup> | -- <sup>6</sup> | -- <sup>6</sup> | -- <sup>6</sup> | -- <sup>6</sup>       | -- <sup>6</sup> | -- <sup>6</sup>  | -- <sup>6</sup> | -- <sup>6</sup>       | -- <sup>6</sup> | -- <sup>6</sup> | -- <sup>6</sup> | -- <sup>6</sup>     | -- <sup>6</sup> | -- <sup>6</sup>            | -- <sup>6</sup> |
| Non-U.S.-Born <sup>8</sup>                                 | 4,659           | 88.7            | 17              | 0.4             | 47              | 1.0             | 37                    | 0.8             | 356              | 7.7             | 3,803                 | 82.2            | 3,684           | 79.4            | 1,376               | 29.6            | 3,964                      | 85.3            |
| <b>Other<sup>9</sup></b>                                   | <b>1,868</b>    | <b>2.4</b>      | <b>69</b>       | <b>3.7</b>      | <b>192</b>      | <b>10.3</b>     | <b>58</b>             | <b>3.1</b>      | <b>203</b>       | <b>10.9</b>     | <b>1,468</b>          | <b>80.4</b>     | <b>1,446</b>    | <b>78.5</b>     | <b>586</b>          | <b>31.6</b>     | <b>1,544</b>               | <b>86.7</b>     |
| U.S. States / D.C.   | 754             | 40.4            | 49              | 6.5             | 129             | 17.1            | 23                    | 3.1             | 90               | 12.0            | 620                   | 83.6            | 614             | 82.2            | 215                 | 28.8            | 573                        | 78.4            |
| Puerto Rico/U.S. Terr. <sup>7</sup>                        | 13              | 0.7             | -- <sup>6</sup> | -- <sup>6</sup> | -- <sup>6</sup> | -- <sup>6</sup> | -- <sup>6</sup>       | -- <sup>6</sup> | 5                | 38.5            | 13                    | 100.0           | 10              | 76.9            | -- <sup>6</sup>     | -- <sup>6</sup> | 5                          | 83.3            |
| Non-U.S.-Born <sup>8</sup>                                 | 1,100           | 58.9            | 17              | 1.5             | 59              | 5.4             | 31                    | 2.8             | 107              | 9.7             | 835                   | 77.9            | 822             | 76.0            | 368                 | 33.7            | 966                        | 92.6            |
| <b>Unknown<sup>10</sup></b>                                | <b>98</b>       | <b>0.1</b>      | -- <sup>6</sup> | -- <sup>6</sup> | <b>7</b>        | <b>7.1</b>      | -- <sup>6</sup>       | -- <sup>6</sup> | <b>6</b>         | <b>10.9</b>     | <b>34</b>             | <b>72.3</b>     | <b>33</b>       | <b>68.8</b>     | <b>20</b>           | <b>37.0</b>     | <b>25</b>                  | <b>59.5</b>     |

NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.

1. This column "Births %", the percentages of the race/Hispanic groups (bolded) are based on the state total (including births of unknown race/ethnicity), and the birthplace percents for the race/ethnicities are based on the total number in race/Hispanic ethnicity category. For all other categories, percentages are based on row totals. 2. Very low birthweight: less than 1,500 grams or 3.3 pounds. 3. Low birthweight: less than 2,500 grams or 5.5 pounds. 4. Beginning with *Births 2001*, the Adequacy of Prenatal Care Utilization Index has replaced the Kessner Index as the measure of adequate prenatal care. 5. Mother was breastfeeding or was intending to breastfeed at the time the birth certificate was completed. 6. Calculations based on fewer than five events are excluded. 7. The category "Puerto Rico/U.S. Territories" includes women born in Puerto Rico, the U.S. Virgin Islands, and Guam. Approximately 95% of the births in this category were to women born in Puerto Rico. 8. The category "Non-U.S.-Born" includes women born outside of the 50 U.S. states, District of Columbia, and Puerto Rico/U.S. territories. 9. Other: Mothers who designated themselves as American Indian or Other race. 10. Unknown: Mothers who did not indicate a race/ethnicity.

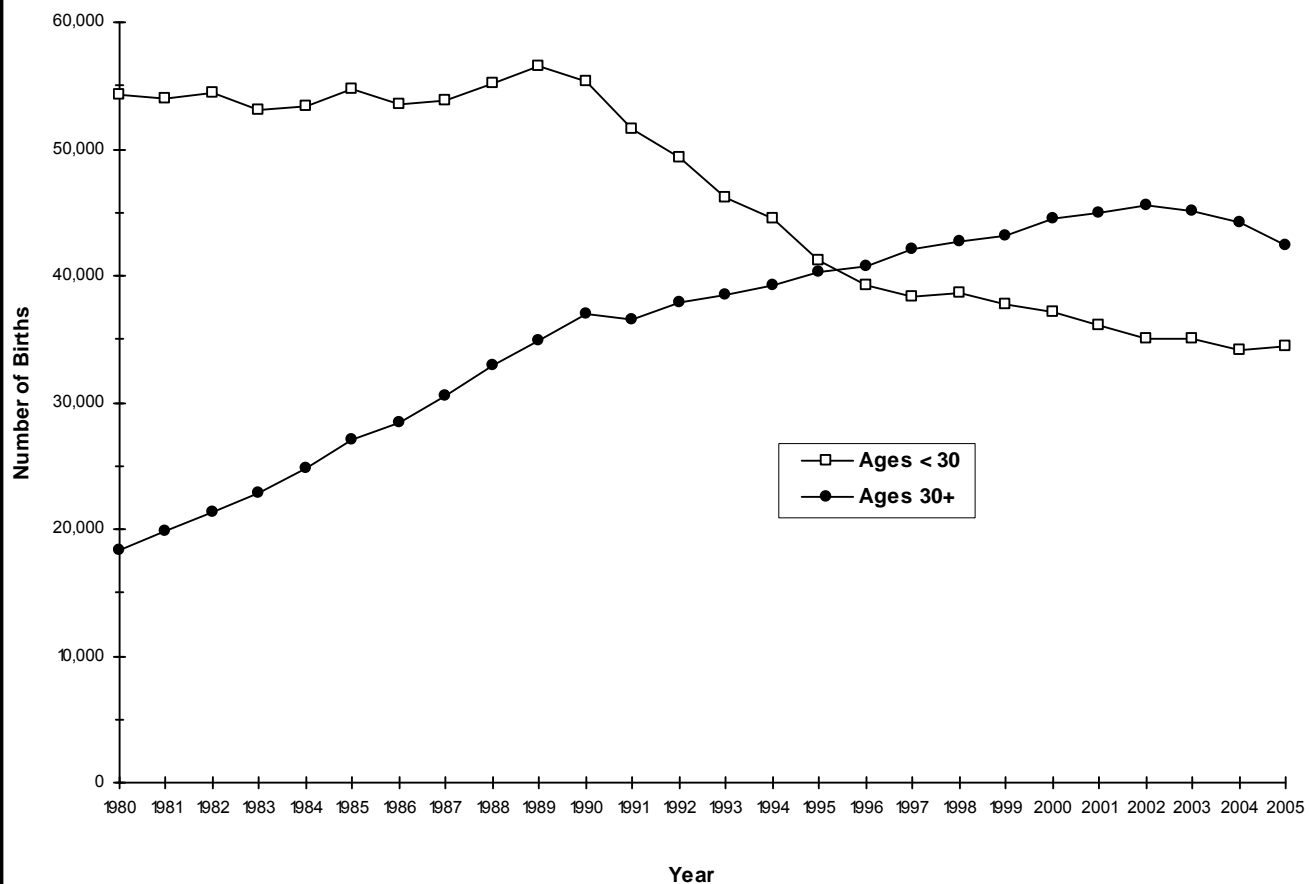
**Table 3. Birth Characteristics by Maternal Ancestry, Massachusetts: 2005**

| Maternal Ancestry       | Births <sup>1</sup> |       | Teen Births     |                 |                 |                 | Birthweight           |                 |                  |      | Prenatal Care         |      |               |      | Cesarean Section |      | Breastfeeding <sup>5</sup> |      |
|-------------------------|---------------------|-------|-----------------|-----------------|-----------------|-----------------|-----------------------|-----------------|------------------|------|-----------------------|------|---------------|------|------------------|------|----------------------------|------|
|                         |                     |       | <18 Years       |                 | <20 Years       |                 | Very Low <sup>2</sup> |                 | Low <sup>3</sup> |      | Adequate <sup>4</sup> |      | 1st Trimester |      |                  |      |                            |      |
|                         | n                   | %     | n               | %               | n               | %               | n                     | %               | n                | %    | n                     | %    | n             | %    | n                | %    | n                          | %    |
| State Total             | 76,824              | 100.0 | 1,499           | 2.0             | 4,598           | 6.0             | 1,098                 | 1.4             | 6,073            | 7.9  | 63,748                | 84.0 | 63,410        | 83.2 | 24,732           | 32.3 | 59,845                     | 79.3 |
| American                | 33,118              | 43.1  | 449             | 1.4             | 1,603           | 4.8             | 460                   | 1.4             | 2,579            | 7.8  | 28,662                | 87.0 | 28,803        | 87.3 | 10,799           | 32.7 | 25,030                     | 75.7 |
| European                | 14,139              | 18.4  | 50              | 0.4             | 246             | 1.7             | 113                   | 0.8             | 872              | 6.2  | 12,277                | 87.4 | 12,248        | 87.0 | 4,844            | 34.4 | 11,812                     | 83.8 |
| Puerto Rican            | 4,414               | 5.7   | 454             | 10.3            | 1,034           | 23.4            | 91                    | 2.1             | 447              | 10.1 | 3,307                 | 76.4 | 3,295         | 75.5 | 1,132            | 25.8 | 3,017                      | 68.9 |
| African-American        | 2,750               | 3.6   | 164             | 6.0             | 456             | 16.6            | 87                    | 3.2             | 364              | 13.3 | 2,037                 | 77.0 | 2,000         | 74.4 | 841              | 30.9 | 1,962                      | 71.9 |
| Brazilian               | 2,058               | 2.7   | 24              | 1.2             | 104             | 5.1             | 19                    | 0.9             | 126              | 6.1  | 1,700                 | 82.8 | 1,598         | 77.8 | 835              | 40.6 | 1,931                      | 93.9 |
| Dominican               | 1,807               | 2.4   | 61              | 3.4             | 188             | 10.4            | 34                    | 1.9             | 133              | 7.4  | 1,364                 | 75.6 | 1,442         | 79.9 | 567              | 31.4 | 1,608                      | 89.1 |
| All others <sup>6</sup> | 1,754               | 2.3   | 36              | 2.1             | 97              | 5.5             | 26                    | 1.5             | 119              | 6.8  | 1,471                 | 84.6 | 1,484         | 85.1 | 536              | 30.7 | 1,390                      | 79.8 |
| Chinese                 | 1,376               | 1.8   | -- <sup>7</sup> | -- <sup>7</sup> | -- <sup>7</sup> | -- <sup>7</sup> | 7                     | 0.5             | 90               | 6.6  | 1,207                 | 87.9 | 1,166         | 84.9 | 394              | 28.7 | 1,226                      | 89.3 |
| Missing                 | 1,312               | 1.7   | 9               | 0.7             | 26              | 2.0             | 61                    | 4.8             | 198              | 15.6 | 956                   | 86.2 | 1,028         | 86.4 | 450              | 37.2 | 135                        | 81.8 |
| Other Portuguese        | 1,295               | 1.7   | 22              | 1.7             | 83              | 6.4             | 17                    | 1.3             | 108              | 8.3  | 1,112                 | 86.1 | 1,106         | 85.6 | 452              | 35.0 | 682                        | 52.7 |
| Asian Indian            | 1,199               | 1.6   | -- <sup>7</sup> | -- <sup>7</sup> | 5               | 0.4             | 7                     | 0.6             | 105              | 8.8  | 967                   | 81.0 | 977           | 81.8 | 418              | 34.9 | 1,147                      | 95.8 |
| Haitian                 | 1,136               | 1.5   | 6               | 0.5             | 23              | 2.0             | 34                    | 3.0             | 125              | 11.0 | 804                   | 74.6 | 747           | 68.7 | 417              | 36.7 | 995                        | 87.6 |
| Other Central American  | 1,110               | 1.4   | 27              | 2.4             | 110             | 9.9             | 12                    | 1.1             | 74               | 6.7  | 758                   | 69.2 | 713           | 65.0 | 251              | 22.7 | 993                        | 89.5 |
| Salvadoran              | 1,046               | 1.4   | 36              | 3.4             | 105             | 10.0            | 7                     | 0.7             | 55               | 5.3  | 750                   | 73.7 | 689           | 67.3 | 212              | 20.3 | 967                        | 92.7 |
| Other African           | 1,035               | 1.3   | 9               | 0.9             | 22              | 2.1             | 20                    | 1.9             | 79               | 7.6  | 765                   | 75.7 | 680           | 66.9 | 358              | 34.7 | 959                        | 92.7 |
| Cape Verdean            | 872                 | 1.1   | 29              | 3.3             | 116             | 13.3            | 17                    | 1.9             | 94               | 10.8 | 626                   | 73.0 | 628           | 72.8 | 272              | 31.3 | 717                        | 82.4 |
| Vietnamese              | 788                 | 1.0   | 15              | 1.9             | 28              | 3.6             | 10                    | 1.3             | 58               | 7.4  | 634                   | 82.0 | 614           | 78.8 | 225              | 28.7 | 575                        | 73.3 |
| Cambodian               | 584                 | 0.8   | 34              | 5.8             | 91              | 15.6            | 7                     | 1.2             | 60               | 10.3 | 370                   | 63.4 | 322           | 55.1 | 93               | 15.9 | 325                        | 55.7 |
| Mexican                 | 526                 | 0.7   | 12              | 2.3             | 39              | 7.4             | -- <sup>7</sup>       | -- <sup>7</sup> | 35               | 6.7  | 398                   | 76.8 | 371           | 71.1 | 163              | 31.1 | 471                        | 89.9 |

NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.

1. In the first category, "Births", percentages are based on column total (state total of births, including births for which maternal ethnicity is unknown and other). For all other categories, percentages are based on row totals. 2. Very low birthweight: less than 1,500 grams or 3.3 pounds. 3. Low birthweight: less than 2,500 grams or 5.5 pounds. 4. The Adequacy of Prenatal Care Utilization Index 2 has replaced the Kessner Index as the measure of adequate prenatal care. 5. Mother was breastfeeding or was intending to breastfeed at the time the birth certificate was completed. 6. "Other" refers to groups not specified on the parents' worksheet. See the Glossary entry "ethnicity" for the complete list of ethnicities. 7. Calculations based on fewer than five events are excluded.

**Figure 1. Trends in the Number of Births by Mother's Age Group, Massachusetts: 1980-2005**



**Table 4. Age-Specific and Crude Birth Rates, Massachusetts: 1990 and 2005**

| Mother's Age                                  | 1990                |       | 2005   |                   | Percent Change<br>in Rate |
|---|---------------------|-------|--------|-------------------|---------------------------|
|   | Births <sup>1</sup> | Rate  | Births | Rate <sup>2</sup> |                           |
| 10-14   | 124                 | 1.3   | 59     | 0.3               | -77.9                     |
| 15-19   | 7,258               | 35.1  | 4,539  | 21.7              | -38.1                     |
| 20-24   | 18,115              | 69.5  | 11,805 | 56.3              | -19.0                     |
| 25-29   | 29,913              | 107.2 | 18,026 | 82.9              | -22.6                     |
| 30-34   | 25,687              | 93.9  | 24,140 | 107.7             | 14.7                      |
| 35-39   | 9,795               | 40.1  | 14,740 | 59.3              | 47.8                      |
| 40-44   | 1,522               | 6.9   | 3,323  | 12.4              | 79.1                      |
| 45+ <sup>3</sup>                              | 46                  | 0.3   | 188    | 0.1               | -53.5                     |
| <b>Birth rate, ages<br/>15-44<sup>4</sup></b> | 92,290              | 62.2  | 76,573 | 55.6              | -10.6                     |
| <b>Crude Birth<br/>Rate<sup>5</sup></b>       | 92,461              | 15.4  | 76,824 | 11.9              | -22.5                     |

NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.

1. Differences in the number of births from previous publications are the result of updating of the birth files. The number of births for all age groups does not always add to the total number of births as mother's age is sometimes not recorded on the birth certificate.

2. 2005 birth rates are calculated using Massachusetts (Department of Public Health) Modified Age, Race/Ethnicity, & Sex Estimates 2005 (MMARS05), released October, 2006 (see Technical Notes in Appendix). 3. Denominator is female population ages 45-49. 4. Rate represents the total number of births to women age 15-44 per 1,000 women age 15 to 44. 5. Births per 1,000 residents (male and female). Includes births to mothers of all age groups and mothers for whom age is unknown.

**Table 5. Trends in Number and Percent Distribution of Births<sup>1</sup> by Plurality and Age  
Massachusetts: 1992-2005**

|                    |      | Singletons |      | Multiples <sup>2</sup> |     |                  |     |                 |     | Total births |       |
|--------------------|------|------------|------|------------------------|-----|------------------|-----|-----------------|-----|--------------|-------|
|                    |      |            |      | Twins                  |     | Triplets or more |     | Total Multiples |     |              |       |
| Age Group          | Year | n          | %    | n                      | %   | n                | %   | n               | %   | n            | %     |
| <b>All Ages</b>    |      |            |      |                        |     |                  |     |                 |     |              |       |
|                    | 1992 | 84,722     | 97.2 | 2,347                  | 2.7 | 133              | 0.2 | 2,480           | 2.8 | 87,202       | 100.0 |
|                    | 1993 | 82,055     | 97.0 | 2,367                  | 2.8 | 205              | 0.2 | 2,572           | 3.0 | 84,627       | 100.0 |
|                    | 1994 | 81,187     | 96.9 | 2,357                  | 2.8 | 214              | 0.3 | 2,571           | 3.1 | 83,758       | 100.0 |
|                    | 1995 | 78,935     | 96.8 | 2,429                  | 3.0 | 198              | 0.2 | 2,627           | 3.2 | 81,562       | 100.0 |
|                    | 1996 | 77,355     | 96.5 | 2,621                  | 3.3 | 194              | 0.2 | 2,815           | 3.5 | 80,164       | 100.0 |
|                    | 1997 | 77,203     | 96.1 | 2,856                  | 3.6 | 262              | 0.3 | 3,118           | 3.9 | 80,321       | 100.0 |
|                    | 1998 | 78,004     | 95.8 | 3,114                  | 3.8 | 288              | 0.4 | 3,402           | 4.2 | 81,406       | 100.0 |
|                    | 1999 | 77,473     | 95.8 | 3,147                  | 3.9 | 246              | 0.3 | 3,393           | 4.2 | 80,866       | 100.0 |
|                    | 2000 | 78,075     | 95.7 | 3,263                  | 4.0 | 244              | 0.3 | 3,507           | 4.3 | 81,582       | 100.0 |
|                    | 2001 | 77,409     | 95.6 | 3,371                  | 4.2 | 234              | 0.3 | 3,605           | 4.4 | 81,014       | 100.0 |
|                    | 2002 | 76,673     | 95.1 | 3,708                  | 4.6 | 243              | 0.3 | 3,951           | 4.9 | 80,624       | 100.0 |
|                    | 2003 | 76,367     | 95.3 | 3,551                  | 4.4 | 249              | 0.3 | 3,800           | 4.7 | 80,167       | 100.0 |
|                    | 2004 | 74,677     | 95.2 | 3,538                  | 4.5 | 245              | 0.3 | 3,783           | 4.8 | 78,460       | 100.0 |
|                    | 2005 | 73,258     | 95.4 | 3,375                  | 4.4 | 190              | 0.2 | 3,565           | 4.6 | 76,824       | 100.0 |
| <b>Ages &lt;35</b> |      |            |      |                        |     |                  |     |                 |     |              |       |
|                    | 1992 | 73,043     | 97.3 | 1,914                  | 2.6 | 103              | 0.1 | 2,017           | 2.7 | 75,060       | 100.0 |
|                    | 1993 | 70,042     | 97.2 | 1,849                  | 2.6 | 158              | 0.2 | 2,007           | 2.8 | 72,049       | 100.0 |
|                    | 1994 | 68,644     | 97.2 | 1,844                  | 2.6 | 164              | 0.2 | 2,008           | 2.8 | 70,652       | 100.0 |
|                    | 1995 | 65,669     | 97.2 | 1,787                  | 2.6 | 141              | 0.2 | 1,928           | 2.9 | 67,597       | 100.0 |
|                    | 1996 | 63,560     | 96.9 | 1,935                  | 2.9 | 126              | 0.2 | 2,061           | 3.1 | 65,621       | 100.0 |
|                    | 1997 | 62,598     | 96.7 | 1,949                  | 3.0 | 170              | 0.3 | 2,119           | 3.3 | 64,717       | 100.0 |
|                    | 1998 | 62,719     | 96.4 | 2,193                  | 3.4 | 170              | 0.3 | 2,363           | 3.6 | 65,082       | 100.0 |
|                    | 1999 | 61,816     | 96.4 | 2,147                  | 3.3 | 150              | 0.2 | 2,297           | 3.6 | 64,113       | 100.0 |
|                    | 2000 | 61,659     | 96.4 | 2,205                  | 3.4 | 130              | 0.2 | 2,335           | 3.6 | 63,994       | 100.0 |
|                    | 2001 | 60,704     | 96.3 | 2,211                  | 3.5 | 134              | 0.2 | 2,345           | 3.7 | 63,049       | 100.0 |
|                    | 2002 | 59,736     | 96.0 | 2,379                  | 3.8 | 127              | 0.2 | 2,506           | 4.0 | 62,242       | 100.0 |
|                    | 2003 | 59,347     | 95.9 | 2,389                  | 3.9 | 118              | 0.2 | 2,507           | 4.1 | 61,854       | 100.0 |
|                    | 2004 | 57,618     | 96.0 | 2,229                  | 3.7 | 142              | 0.2 | 2,371           | 4.0 | 59,989       | 100.0 |
|                    | 2005 | 56,380     | 96.3 | 2,086                  | 3.6 | 102              | 0.2 | 2,188           | 3.7 | 58,569       | 100.0 |
| <b>Ages 35+</b>    |      |            |      |                        |     |                  |     |                 |     |              |       |
|                    | 1992 | 11,675     | 96.2 | 433                    | 3.6 | 30               | 0.3 | 463             | 3.8 | 12,138       | 100.0 |
|                    | 1993 | 12,007     | 95.5 | 518                    | 4.1 | 47               | 0.4 | 565             | 4.5 | 12,572       | 100.0 |
|                    | 1994 | 12,543     | 95.7 | 513                    | 3.9 | 50               | 0.4 | 563             | 4.3 | 13,106       | 100.0 |
|                    | 1995 | 13,264     | 95.0 | 642                    | 4.6 | 57               | 0.4 | 699             | 5.0 | 13,963       | 100.0 |
|                    | 1996 | 13,793     | 94.8 | 686                    | 4.7 | 68               | 0.5 | 754             | 5.2 | 14,547       | 100.0 |
|                    | 1997 | 14,602     | 93.6 | 907                    | 5.8 | 92               | 0.6 | 999             | 6.4 | 15,601       | 100.0 |
|                    | 1998 | 15,282     | 93.6 | 921                    | 5.6 | 118              | 0.7 | 1,039           | 6.4 | 16,321       | 100.0 |
|                    | 1999 | 15,657     | 93.5 | 1,000                  | 6.0 | 96               | 0.6 | 1,096           | 6.5 | 16,753       | 100.0 |
|                    | 2000 | 16,412     | 93.3 | 1,058                  | 6.0 | 114              | 0.6 | 1,172           | 6.7 | 17,584       | 100.0 |
|                    | 2001 | 16,703     | 93.0 | 1,160                  | 6.5 | 100              | 0.6 | 1,260           | 7.0 | 17,963       | 100.0 |
|                    | 2002 | 16,936     | 92.1 | 1,329                  | 7.2 | 116              | 0.6 | 1,445           | 7.9 | 18,381       | 100.0 |
|                    | 2003 | 17,015     | 92.9 | 1,162                  | 6.3 | 131              | 0.7 | 1,293           | 7.1 | 18,308       | 100.0 |
|                    | 2004 | 17,055     | 92.4 | 1,309                  | 7.1 | 103              | 0.6 | 1,412           | 7.6 | 18,467       | 100.0 |
|                    | 2005 | 16,874     | 92.5 | 1,289                  | 7.1 | 88               | 0.5 | 1,377           | 7.5 | 18,251       | 100.0 |

NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.

1. Differences in the number of births from previous publications are the result of updated files. 2. Numbers of multiples (n) represent individual infants rather than sets of infants.

**Table 6. Summary of Selected Teen Birth Characteristics, Massachusetts: 2005**

|  | Age 15-17    |                 | Age 18-19    |                 | Combined Ages 15-19 |                 |
|--|--------------|-----------------|--------------|-----------------|---------------------|-----------------|
|  | N            | % <sup>1</sup>  | N            | % <sup>1</sup>  | N                   | % <sup>1</sup>  |
| <b>State total</b>                           | <b>1,440</b> | <b>31.7%</b>    | <b>3,099</b> | <b>68.3</b>     | <b>4,539</b>        | <b>100.0%</b>   |
| <b>Maternal Demographics</b>                 |              |                 |              |                 |                     |                 |
| <b>Race/Hispanic Ethnicity</b>               | N            | % <sup>2</sup>  | N            | % <sup>2</sup>  | N                   | % <sup>2</sup>  |
| White non-Hispanic                           | 537          | 37.4            | 1,535        | 48.0            | 2,072               | 44.7            |
| Black non-Hispanic                           | 190          | 13.2            | 397          | 12.4            | 587                 | 12.7            |
| Asian  | 64           | 4.5             | 197          | 6.2             | 261                 | 5.6             |
| Hispanic                                     | 580          | 40.4            | 943          | 29.5            | 1,523               | 32.9            |
| Other  | 66           | 4.6             | 123          | 3.8             | 189                 | 4.1             |
| <b>Birthplace</b>                            |              |                 |              |                 |                     |                 |
| U.S. States / D.C.                           | 1,098        | 76.3            | 2,364        | 76.3            | 3,462               | 76.3            |
| Puerto Rico / US Terr.                       | 155          | 10.8            | 221          | 7.1             | 376                 | 8.3             |
| Non-U.S.-born                                | 186          | 12.9            | 513          | 16.6            | 699                 | 15.4            |
| <b>Prenatal care funding</b>                 |              |                 |              |                 |                     |                 |
| Public                                       | 1,067        | 75.9            | 2,368        | 77.5            | 3,435               | 77.0            |
| Private, other                               | 339          | 24.1            | 688          | 22.5            | 1,027               | 23.0            |
| <b>Pregnancy-Related Factors</b>             |              |                 |              |                 |                     |                 |
| <b>Adequacy of Prenatal Care<sup>3</sup></b> |              |                 |              |                 |                     |                 |
| Adequate Total <sup>4</sup>                  | 948          | 67.0            | 2,176        | 71.1            | 3,124               | 69.8            |
| Adequate Intensive                           | 455          | 32.2            | 983          | 32.1            | 1,438               | 32.1            |
| Adequate Basic                               | 493          | 34.9            | 1,193        | 39.0            | 1,686               | 37.7            |
| Intermediate                                 | 133          | 9.4             | 333          | 10.9            | 466                 | 10.4            |
| Inadequate/None                              | 333          | 23.6            | 550          | 18.0            | 883                 | 19.7            |
| Unknown                                      | 26           | 1.8             | 40           | 1.3             | 66                  | 1.5             |
| <b>Parity<sup>6</sup></b>                    |              |                 |              |                 |                     |                 |
| 1  | 1,351        | 94.0            | 2,510        | 81.3            | 3,861               | 85.3            |
| 2  | 80           | 5.6             | 519          | 16.8            | 599                 | 13.2            |
| 3+   | 6            | 0.4             | 60           | 1.9             | 66                  | 1.5             |
| <b>Smoking during Pregnancy</b>              |              |                 |              |                 |                     |                 |
| Yes  | 155          | 10.8            | 484          | 15.7            | 639                 | 14.1            |
| No   | 1,284        | 89.2            | 2,607        | 84.3            | 3,891               | 85.9            |
| <b>Birth Outcomes</b>                        |              |                 |              |                 |                     |                 |
| <b>Birthweight</b>                           |              |                 |              |                 |                     |                 |
| < 500 g                                      | 4            | -- <sup>5</sup> | 7            | 0.2             | 11                  | 0.2             |
| 500-1,499 g                                  | 35           | 2.4             | 38           | 1.2             | 73                  | 1.6             |
| 1,500-2,499 g                                | 128          | 8.9             | 244          | 7.9             | 372                 | 8.2             |
| <b>LBW (&lt;2,499 g)</b>                     | <b>167</b>   | <b>11.6</b>     | <b>289</b>   | <b>9.0</b>      | <b>456</b>          | <b>10.1</b>     |
| 2,500-3,999 g                                | 1,211        | 84.2            | 2,633        | 85.1            | 3,844               | 84.8            |
| 4000+ g                                      | 60           | 4.2             | 172          | 5.6             | 232                 | 5.1             |
| <b>Gestational age</b>                       |              |                 |              |                 |                     |                 |
| < 28 weeks                                   | 18           | 1.3             | 25           | 0.8             | 43                  | 1.0             |
| < 37 weeks                                   | 160          | 11.2            | 282          | 9.1             | 442                 | 9.8             |
| 37-42 weeks                                  | 1,270        | 88.8            | 2,802        | 90.8            | 4,072               | 90.2            |
| 43+ weeks                                    | 0            | -- <sup>5</sup> | 1            | -- <sup>5</sup> | 1                   | -- <sup>5</sup> |
| <b>Plurality</b>                             |              |                 |              |                 |                     |                 |
| Singleton                                    | 1,422        | 98.8            | 3,047        | 98.3            | 4,469               | 98.5            |
| Multiple birth                               | 18           | 1.3             | 52           | 1.7             | 70                  | 1.5             |

NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.

1. For state total row, percentages are based on total births to women ages 15-19. For the rest of the table, percentages are based on births for a given age group and characteristic. 2. Percents are based on state total of the age group. 3. Based on Adequacy of Prenatal Care Utilization (APNCU) Index. 4.

Adequate Total = Adequate Basic + Adequate Intensive. 5. Calculations based on fewer than five events are excluded. 6. Number of live births including the current birth.

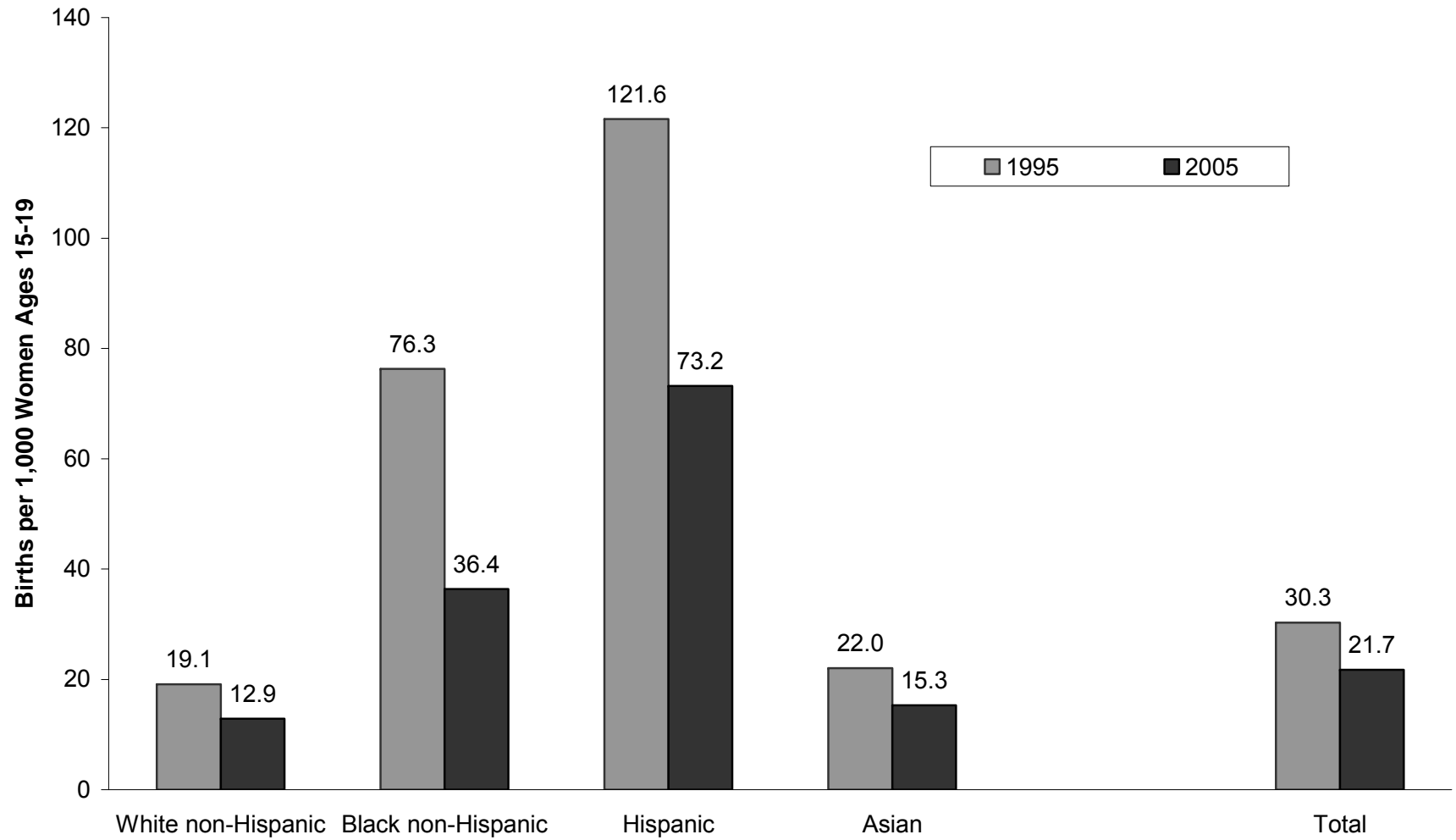


**Table 7. Trends in Teen Birth Rates for Selected Communities<sup>1</sup>, Ranked by 2005 Teen Birth Rate<sup>2</sup>,  
Massachusetts: 1995, 2004, 2005**

| 2005 Rank | Municipality       | 1995 <sup>3</sup>     |                 | 2004                  |                 | 2005                  |                 |
|-----------|--------------------|-----------------------|-----------------|-----------------------|-----------------|-----------------------|-----------------|
|           |                    | Number of Teen Births | Teen Birth Rate | Number of Teen Births | Teen Birth Rate | Number of Teen Births | Teen Birth Rate |
|           | <b>State Total</b> | <b>5,990</b>          | <b>30.3</b>     | <b>4,559</b>          | <b>22.2</b>     | <b>4,539</b>          | <b>21.7</b>     |
| <b>1</b>  | Holyoke            | 170                   | 126.3           | 115                   | 76.2            | 146                   | 96.8            |
| <b>2</b>  | Chelsea            | 74                    | 83.7            | 73                    | 73.0            | 75                    | 75.0            |
| <b>3</b>  | Lawrence           | 286                   | 115.4           | 226                   | 74.7            | 217                   | 71.7            |
| <b>4</b>  | Springfield        | 448                   | 83.0            | 428                   | 70.5            | 435                   | 71.6            |
| <b>5</b>  | Southbridge        | 43                    | 78.2            | 38                    | 68.1            | 36                    | 64.5            |
| <b>6</b>  | New Bedford        | 203                   | 66.9            | 183                   | 61.9            | 174                   | 58.9            |
| <b>7</b>  | Pittsfield         | 68                    | 48.8            | 59                    | 46.4            | 67                    | 52.7            |
| <b>8</b>  | Lowell             | 298                   | 84.7            | 194                   | 48.9            | 204                   | 51.4            |
| <b>9</b>  | Fall River         | 169                   | 61.2            | 171                   | 60.4            | 140                   | 49.5            |
| <b>10</b> | Lynn               | 175                   | 75.7            | 135                   | 43.8            | 146                   | 47.3            |
| <b>11</b> | Revere             | 44                    | 42.0            | 42                    | 39.9            | 48                    | 45.6            |
| <b>12</b> | Chicopee           | 59                    | 34.0            | 64                    | 36.8            | 72                    | 41.4            |
| <b>13</b> | Brockton           | 183                   | 67.3            | 161                   | 44.3            | 148                   | 40.7            |
| <b>14</b> | Fitchburg          | 93                    | 57.8            | 70                    | 44.8            | 62                    | 39.6            |
| <b>15</b> | Worcester          | 349                   | 56.2            | 250                   | 35.5            | 262                   | 37.2            |
| <b>16</b> | Everett            | 37                    | 39.9            | 34                    | 32.1            | 35                    | 33.0            |
| <b>17</b> | Taunton            | 85                    | 56.0            | 54                    | 33.1            | 53                    | 32.5            |
| <b>18</b> | Haverhill          | 88                    | 56.8            | 56                    | 29.3            | 59                    | 30.9            |
| <b>19</b> | Boston             | 880                   | 47.5            | 578                   | 29.2            | 566                   | 28.6            |
| <b>20</b> | Methuen            | 49                    | 39.3            | 38                    | 28.6            | 36                    | 27.1            |
| <b>21</b> | Attleboro          | 47                    | 44.7            | 37                    | 32.6            | 29                    | 25.6            |
| <b>22</b> | Quincy             | 44                    | 22.1            | 34                    | 16.4            | 48                    | 23.1            |
| <b>23</b> | Framingham         | 51                    | 26.8            | 44                    | 22.5            | 45                    | 23.0            |
| <b>24</b> | Barnstable         | 23                    | 19.4            | 21                    | 15.4            | 29                    | 21.3            |
| <b>25</b> | Somerville         | 57                    | 34.7            | 36                    | 16.6            | 37                    | 17.1            |

1. Selected communities include the 25 Massachusetts cities and towns with the greatest number of teen births. Ranking is by 2005 teen birth rate. 2. Rates are per 1,000 females ages 15-19 per city/town.  
3. Source for 1995 births and rates: Massachusetts Community Health Information Profile (MassCHIP), MDPH, v3.0 r315, December 2006; natality dataset and MISER 1995 population estimate.

**Figure 2. Birth Rates Among Women Ages 15-19 by Mother's Race and Hispanic Ethnicity, Massachusetts: 1995-2005**



Teen birth rate is number of births to women ages 15-19 per 1,000 women ages 15-19

Population data sources: denominators for 1995 rates are based on the 1993 MISER Population Estimates. 2005 birth rates are calculated using Massachusetts (Department of Public Health) Modified Age, Race/Ethnicity, & Sex Estimates 2005 (MMARS05), released October, 2006.

Table 8. Births by Birthweight, Race and Hispanic Ethnicity, Massachusetts: 2005

| Birthweight<br>(in grams)               | Total         |                | White non-<br>Hispanic |                | Black non-<br>Hispanic |                | Hispanic      |                | Asian        |                 | Other        |                 | Unknown<br>race/ethnicity<br>n |
|---|---------------|----------------|------------------------|----------------|------------------------|----------------|---------------|----------------|--------------|-----------------|--------------|-----------------|--------------------------------|
|   | n             | % <sup>1</sup> | n                      | % <sup>1</sup> | n                      | % <sup>1</sup> | n             | % <sup>1</sup> | n            | % <sup>1</sup>  | n            | % <sup>1</sup>  |                                |
| <b>State Total</b>                      | <b>76,824</b> | <b>100.0</b>   | <b>53,469</b>          | <b>100.0</b>   | <b>6,077</b>           | <b>100.0</b>   | <b>10,061</b> | <b>100.0</b>   | <b>5,251</b> | <b>100.0</b>    | <b>1,868</b> | <b>100.0</b>    | <b>98</b>                      |
| <b>&lt;500</b>                          | 127           | 0.2            | 72                     | 0.1            | 19                     | 0.3            | 23            | 0.2            | 3            | -- <sup>2</sup> | 7            | 0.4             | 3                              |
| <b>500-999</b>                          | 408           | 0.5            | 211                    | 0.4            | 88                     | 1.4            | 64            | 0.6            | 19           | 0.4             | 26           | 1.4             | 0                              |
| <b>1,000-1,499</b>                      | 563           | 0.7            | 370                    | 0.7            | 70                     | 1.2            | 73            | 0.7            | 25           | 0.5             | 25           | 1.3             | 0                              |
| <b>1,500-1,999</b>                      | 1,285         | 1.7            | 846                    | 1.6            | 153                    | 2.5            | 157           | 1.6            | 86           | 1.6             | 43           | 2.3             | 0                              |
| <b>2,000-2,499</b>                      | 3,690         | 4.8            | 2,397                  | 4.5            | 401                    | 6.6            | 511           | 5.1            | 276          | 5.3             | 102          | 5.5             | 3                              |
| <b>2,500-2,999</b>                      | 12,351        | 16.1           | 7,625                  | 14.3           | 1,258                  | 20.7           | 1,947         | 19.4           | 1,186        | 22.6            | 325          | 17.4            | 10                             |
| <b>3,000-3,499</b>                      | 28,545        | 37.2           | 19,264                 | 36.0           | 2,248                  | 37.0           | 4,041         | 40.2           | 2,246        | 42.8            | 726          | 38.9            | 20                             |
| <b>3,500-3,999</b>                      | 22,258        | 29.0           | 16,612                 | 31.1           | 1,443                  | 23.7           | 2,551         | 25.4           | 1,146        | 21.8            | 491          | 26.3            | 15                             |
| <b>4,000-4,499</b>                      | 6,345         | 8.3            | 5,107                  | 9.6            | 332                    | 5.5            | 573           | 5.7            | 228          | 4.3             | 101          | 5.4             | 4                              |
| <b>4,500-4,999</b>                      | 1,022         | 1.3            | 829                    | 1.6            | 51                     | 0.8            | 97            | 1.0            | 24           | 0.5             | 21           | 1.1             | 0                              |
| <b>&gt;=5,000</b>                       | 102           | 0.1            | 81                     | 0.2            | 8                      | 0.1            | 10            | 0.1            | 3            | -- <sup>2</sup> | 0            | -- <sup>2</sup> | 0                              |
| <b>Unknown<br/>birthweight</b>          | 128           | 0.2            | 55                     | 0.1            | 6                      | 0.1            | 14            | 0.1            | 9            | 0.2             | 1            | -- <sup>2</sup> | 43                             |
| <b>VLBW<sup>3</sup><br/>(0-1,499 g)</b> | 1,098         | 1.4            | 653                    | 1.2            | 177                    | 2.9            | 160           | 1.6            | 47           | 0.9             | 58           | 3.1             | 3                              |
| <b>LBW<sup>4</sup><br/>(0-2,499 g)</b>  | 6,073         | 7.9            | 3,896                  | 7.3            | 731                    | 12.0           | 828           | 8.2            | 409          | 7.8             | 203          | 10.9            | 6                              |

NOTE: Percentages for detailed birthweight rows ("<500" through "Unknown birthweight") are calculated based on births including those with unknown birthweight. Percentages for VLBW and LBW rows are calculated based on births with known birthweight only.

1. Percentages are based on column totals. 2. Calculations based on fewer than five events are excluded. 3. Very Low Birthweight (VLBW): less than 1,500 grams (3.3 lbs.).

4. Low Birthweight (LBW): less than 2,500 grams (5.5 lbs.).

**Table 9. Low Birthweight by Plurality, Massachusetts: 1995-2005**

| Age Group | Year | Singleton         |     |                  |     | Multiples         |      |                  |      |                   |      |                  |      | Total Births      |      |                  |      |                   |     |                  |     |
|-----------|------|-------------------|-----|------------------|-----|-------------------|------|------------------|------|-------------------|------|------------------|------|-------------------|------|------------------|------|-------------------|-----|------------------|-----|
|           |      |                   |     |                  |     | Twin              |      |                  |      | Triplets or more  |      |                  |      | Total Multiples   |      |                  |      |                   |     |                  |     |
|           |      | VLBW <sup>1</sup> |     | LBW <sup>2</sup> |     | VLBW <sup>1</sup> |      | LBW <sup>2</sup> |      | VLBW <sup>1</sup> |      | LBW <sup>2</sup> |      | VLBW <sup>1</sup> |      | LBW <sup>2</sup> |      | VLBW <sup>1</sup> |     | LBW <sup>2</sup> |     |
|           |      | n                 | %   | n                | %   | n                 | %    | n                | %    | n                 | %    | n                | %    | n                 | %    | n                | %    | n                 | %   | n                | %   |
| All Ages  | 1995 | 674               | 0.9 | 3,867            | 4.9 | 227               | 9.4  | 1,128            | 46.6 | 63                | 31.8 | 179              | 90.4 | 290               | 11.1 | 1,307            | 49.9 | 964               | 1.2 | 5,174            | 6.4 |
|           | 1996 | 657               | 0.9 | 3,674            | 4.8 | 227               | 8.8  | 1,264            | 49.1 | 45                | 24.5 | 167              | 90.8 | 272               | 9.9  | 1,431            | 51.9 | 929               | 1.2 | 5,105            | 6.4 |
|           | 1997 | 731               | 0.9 | 3,938            | 5.1 | 292               | 10.3 | 1,439            | 50.5 | 75                | 28.6 | 240              | 91.6 | 367               | 11.8 | 1,679            | 54.0 | 1,098             | 1.4 | 5,617            | 7.0 |
|           | 1998 | 690               | 0.9 | 3,819            | 4.9 | 298               | 9.6  | 1,570            | 50.7 | 82                | 28.5 | 266              | 92.4 | 380               | 11.2 | 1,836            | 54.2 | 1,070             | 1.3 | 5,655            | 7.0 |
|           | 1999 | 731               | 0.9 | 3,869            | 5.0 | 324               | 10.3 | 1,617            | 51.6 | 65                | 26.5 | 222              | 90.6 | 389               | 11.5 | 1,839            | 54.5 | 1,120             | 1.4 | 5,708            | 7.1 |
|           | 2000 | 722               | 0.9 | 3,886            | 5.1 | 284               | 8.9  | 1,603            | 50.0 | 84                | 35.0 | 222              | 92.5 | 368               | 10.7 | 1,825            | 53.0 | 1,090             | 1.4 | 5,711            | 7.1 |
|           | 2001 | 730               | 0.9 | 3,931            | 5.1 | 310               | 9.2  | 1,654            | 49.2 | 74                | 32.9 | 210              | 93.3 | 384               | 10.7 | 1,864            | 52.0 | 1,114             | 1.4 | 5,795            | 7.2 |
|           | 2002 | 699               | 0.9 | 3,972            | 5.2 | 342               | 9.2  | 1,855            | 50.2 | 68                | 28.0 | 233              | 95.9 | 410               | 10.4 | 2,088            | 53.0 | 1,109             | 1.4 | 6,060            | 7.5 |
|           | 2003 | 713               | 0.9 | 4,006            | 5.3 | 331               | 9.3  | 1,877            | 52.9 | 71                | 28.5 | 232              | 93.2 | 402               | 10.6 | 2,109            | 55.6 | 1,115             | 1.4 | 6,115            | 7.6 |
|           | 2004 | 740               | 1.0 | 4,015            | 5.4 | 324               | 9.2  | 1,879            | 53.2 | 84                | 34.4 | 231              | 94.7 | 408               | 10.8 | 2,110            | 55.9 | 1,148             | 1.5 | 6,125            | 7.8 |
| Ages < 35 | 2005 | 701               | 1.0 | 4,126            | 5.6 | 322               | 9.5  | 1,765            | 52.3 | 75                | 39.5 | 181              | 95.3 | 397               | 11.1 | 1,946            | 54.6 | 1,098             | 1.4 | 6,072            | 7.9 |
|           | 1995 | 543               | 0.8 | 3,187            | 4.9 | 196               | 11.0 | 852              | 47.9 | 52                | 36.9 | 135              | 95.7 | 248               | 12.9 | 987              | 51.4 | 791               | 1.2 | 4,174            | 6.2 |
|           | 1996 | 501               | 0.8 | 2,937            | 4.7 | 194               | 10.2 | 944              | 49.9 | 32                | 27.1 | 111              | 94.1 | 226               | 11.2 | 1,055            | 52.5 | 727               | 1.1 | 3,992            | 6.1 |
|           | 1997 | 566               | 0.9 | 3,179            | 5.1 | 214               | 11.0 | 1,030            | 53.0 | 46                | 27.1 | 153              | 90.0 | 260               | 12.3 | 1,183            | 55.9 | 826               | 1.3 | 4,362            | 6.8 |
|           | 1998 | 540               | 0.9 | 3,086            | 4.9 | 248               | 11.4 | 1,148            | 52.5 | 60                | 35.3 | 153              | 90.0 | 308               | 13.1 | 1,301            | 55.2 | 848               | 1.3 | 4,387            | 6.8 |
|           | 1999 | 569               | 0.9 | 3,082            | 5.0 | 231               | 10.8 | 1,124            | 52.6 | 49                | 32.9 | 138              | 92.6 | 280               | 12.3 | 1,262            | 55.2 | 849               | 1.3 | 4,344            | 6.8 |
|           | 2000 | 555               | 0.9 | 3,096            | 5.1 | 204               | 9.4  | 1,097            | 50.7 | 49                | 38.0 | 125              | 96.9 | 253               | 11.0 | 1,222            | 53.3 | 808               | 1.3 | 4,318            | 6.9 |
|           | 2001 | 576               | 1.0 | 3,147            | 5.2 | 235               | 10.7 | 1,156            | 52.4 | 41                | 31.3 | 120              | 91.6 | 276               | 11.8 | 1,276            | 54.6 | 852               | 1.4 | 4,423            | 7.0 |
|           | 2002 | 537               | 0.9 | 3,129            | 5.2 | 237               | 10.0 | 1,229            | 51.9 | 42                | 33.1 | 125              | 98.4 | 279               | 11.2 | 1,354            | 54.2 | 816               | 1.3 | 4,483            | 7.2 |
|           | 2003 | 539               | 0.9 | 3,161            | 5.3 | 256               | 10.7 | 1,325            | 55.5 | 38                | 32.2 | 114              | 96.6 | 294               | 11.7 | 1,439            | 57.5 | 833               | 1.3 | 4,600            | 7.5 |
| Ages 35+  | 2004 | 565               | 1.0 | 3,128            | 5.4 | 207               | 9.3  | 1,224            | 55.0 | 56                | 39.7 | 133              | 94.3 | 263               | 11.1 | 1,357            | 57.3 | 828               | 1.4 | 4,485            | 7.5 |
|           | 2005 | 552               | 1.0 | 3,198            | 5.7 | 215               | 10.3 | 1,149            | 55.1 | 47                | 46.1 | 100              | 98.0 | 262               | 12.0 | 1,249            | 57.1 | 814               | 1.4 | 4,447            | 7.6 |
|           | 1995 | 130               | 1.0 | 679              | 5.1 | 31                | 4.8  | 276              | 43.0 | 11                | 19.3 | 44               | 77.2 | 42                | 6.0  | 320              | 45.8 | 172               | 1.2 | 999              | 7.2 |
|           | 1996 | 156               | 1.1 | 737              | 5.4 | 33                | 4.9  | 320              | 47.1 | 13                | 19.7 | 56               | 84.8 | 46                | 6.2  | 376              | 50.5 | 202               | 1.4 | 1,113            | 7.7 |
|           | 1997 | 165               | 1.1 | 759              | 5.2 | 78                | 8.6  | 409              | 45.3 | 29                | 31.5 | 87               | 94.6 | 107               | 10.8 | 496              | 49.9 | 272               | 1.7 | 1,255            | 8.1 |
|           | 1998 | 150               | 1.0 | 733              | 4.8 | 50                | 5.5  | 422              | 46.2 | 22                | 18.6 | 113              | 95.8 | 72                | 7.0  | 535              | 51.8 | 222               | 1.4 | 1,268            | 7.8 |
|           | 1999 | 162               | 1.0 | 787              | 5.0 | 93                | 9.3  | 493              | 49.5 | 16                | 16.7 | 84               | 87.5 | 109               | 10.0 | 577              | 52.8 | 271               | 1.6 | 1,364            | 8.2 |
|           | 2000 | 167               | 1.0 | 790              | 4.9 | 80                | 7.7  | 506              | 48.6 | 35                | 31.5 | 97               | 87.4 | 115               | 10.0 | 603              | 52.3 | 282               | 1.6 | 1,393            | 8.1 |
|           | 2001 | 154               | 0.9 | 784              | 4.7 | 75                | 6.5  | 498              | 43.2 | 33                | 35.1 | 90               | 95.7 | 108               | 8.7  | 588              | 47.2 | 262               | 1.5 | 1,372            | 7.7 |
|           | 2002 | 161               | 1.0 | 842              | 5.0 | 105               | 7.9  | 626              | 47.1 | 26                | 22.4 | 108              | 93.1 | 131               | 9.1  | 734              | 50.8 | 292               | 1.6 | 1,576            | 8.6 |
| Ages 35+  | 2003 | 174               | 1.0 | 844              | 5.0 | 75                | 6.5  | 552              | 47.5 | 33                | 25.2 | 118              | 90.1 | 108               | 8.4  | 670              | 51.9 | 282               | 1.5 | 1,514            | 8.3 |
|           | 2004 | 174               | 1.0 | 886              | 5.2 | 117               | 9.0  | 655              | 50.2 | 28                | 27.2 | 98               | 95.1 | 145               | 10.3 | 753              | 53.5 | 319               | 1.7 | 1,639            | 8.9 |
|           | 2005 | 149               | 0.9 | 927              | 5.5 | 107               | 8.3  | 616              | 47.8 | 28                | 31.8 | 81               | 92.0 | 135               | 9.8  | 697              | 50.6 | 284               | 1.6 | 1,624            | 8.9 |

NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.

1. Very Low Birthweight (VLBW): less than 1,500 grams (3.3 lbs.). 2. Low Birthweight (LBW): less than 2,500 grams (5.5 lbs.).

Table 10. Births by Gestational Age<sup>1</sup>, Race and Hispanic Ethnicity, Massachusetts: 2005

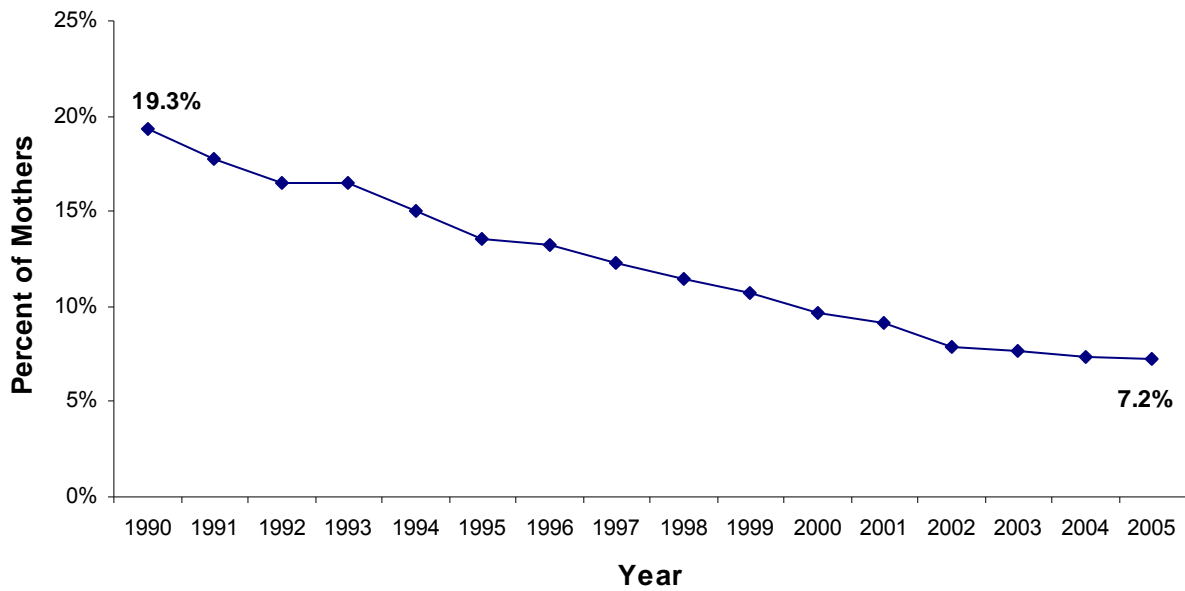
| Gestational Age <sup>4</sup><br>(weeks completed)     | Total  |                 | White non-Hispanic |                 | Black non-Hispanic |                 | Hispanic |                 | Asian |                 | Other <sup>3</sup> |                 | Unknown |
|---|--------|-----------------|--------------------|-----------------|--------------------|-----------------|----------|-----------------|-------|-----------------|--------------------|-----------------|---------|
|   | n      | % <sup>2</sup>  | n                  | % <sup>2</sup>  | n                  | % <sup>2</sup>  | n        | % <sup>2</sup>  | n     | % <sup>2</sup>  | n                  | % <sup>2</sup>  | n       |
| <b>State Total</b>                                    | 76,824 | 100.0           | 53,469             | 100.0           | 6,077              | 100.0           | 10,061   | 100.0           | 5,251 | 100.0           | 1,868              | 100.0           | 98      |
| <b>&lt;20</b>   | 23     | 0.0             | 9                  | 0.0             | 3                  | -- <sup>8</sup> | 7        | 0.1             | 0     | -- <sup>8</sup> | 4                  | -- <sup>8</sup> | 0       |
| <b>20-23</b>  | 142    | 0.2             | 84                 | 0.2             | 26                 | 0.4             | 21       | 0.2             | 4     | -- <sup>8</sup> | 5                  | 0.3             | 2       |
| <b>24-27</b>  | 325    | 0.4             | 169                | 0.3             | 71                 | 1.2             | 52       | 0.5             | 12    | 0.2             | 20                 | 1.1             | 1       |
| <b>28-31</b>  | 707    | 0.9             | 470                | 0.9             | 85                 | 1.4             | 91       | 0.9             | 33    | 0.6             | 28                 | 1.5             | 0       |
| <b>32-35</b>  | 3,160  | 4.1             | 2,186              | 4.1             | 297                | 4.9             | 421      | 4.2             | 173   | 3.3             | 81                 | 4.3             | 2       |
| <b>36</b>   | 2,568  | 3.3             | 1,751              | 3.3             | 266                | 4.4             | 315      | 3.1             | 162   | 3.1             | 72                 | 3.9             | 2       |
| <b>37-39</b>  | 37,564 | 48.9            | 26,104             | 48.8            | 2,821              | 46.4            | 5,035    | 50.0            | 2,765 | 52.7            | 816                | 43.7            | 23      |
| <b>40</b>   | 23,747 | 30.9            | 16,657             | 31.2            | 1,792              | 29.5            | 3,071    | 30.5            | 1,610 | 30.7            | 601                | 32.2            | 16      |
| <b>41</b>   | 7,683  | 10.0            | 5,487              | 10.3            | 613                | 10.1            | 916      | 9.1             | 453   | 8.6             | 206                | 11.0            | 8       |
| <b>42</b>   | 581    | 0.8             | 381                | 0.7             | 61                 | 1.0             | 87       | 0.9             | 27    | 0.5             | 25                 | 1.3             | 0       |
| <b>43</b>   | 20     | 0.0             | 8                  | 0.0             | 8                  | 0.1             | 3        | -- <sup>8</sup> | 0     | -- <sup>8</sup> | 1                  | -- <sup>8</sup> | 0       |
| <b>44+</b>  | 2      | -- <sup>8</sup> | 2                  | -- <sup>8</sup> | 0                  | -- <sup>8</sup> | 0        | -- <sup>8</sup> | 0     | -- <sup>8</sup> | 0                  | -- <sup>8</sup> | 0       |
| <b>Unknown<sup>5</sup></b>                            | 302    | 0.4             | 161                | 0.3             | 34                 | 0.6             | 42       | 0.4             | 12    | 0.2             | 9                  | 0.5             | 44      |
| <b>Very early gestation, &lt;28 weeks<sup>6</sup></b> | 490    | 0.6             | 262                | 0.5             | 100                | 1.7             | 80       | 0.8             | 16    | 0.3             | 29                 | 1.6             | 3       |
| <b>Preterm, &lt;37 weeks<sup>7</sup></b>              | 6,925  | 9.0             | 4,669              | 8.8             | 748                | 12.4            | 907      | 9.1             | 384   | 7.3             | 210                | 11.3            | 7       |

NOTE: Percentages for detailed gestational age category rows ("<20" through "Unknown") are calculated based on births including those with unknown gestational age. Percentages for "Very early gestation" and "Preterm" rows are calculated based on births with known gestational age only.

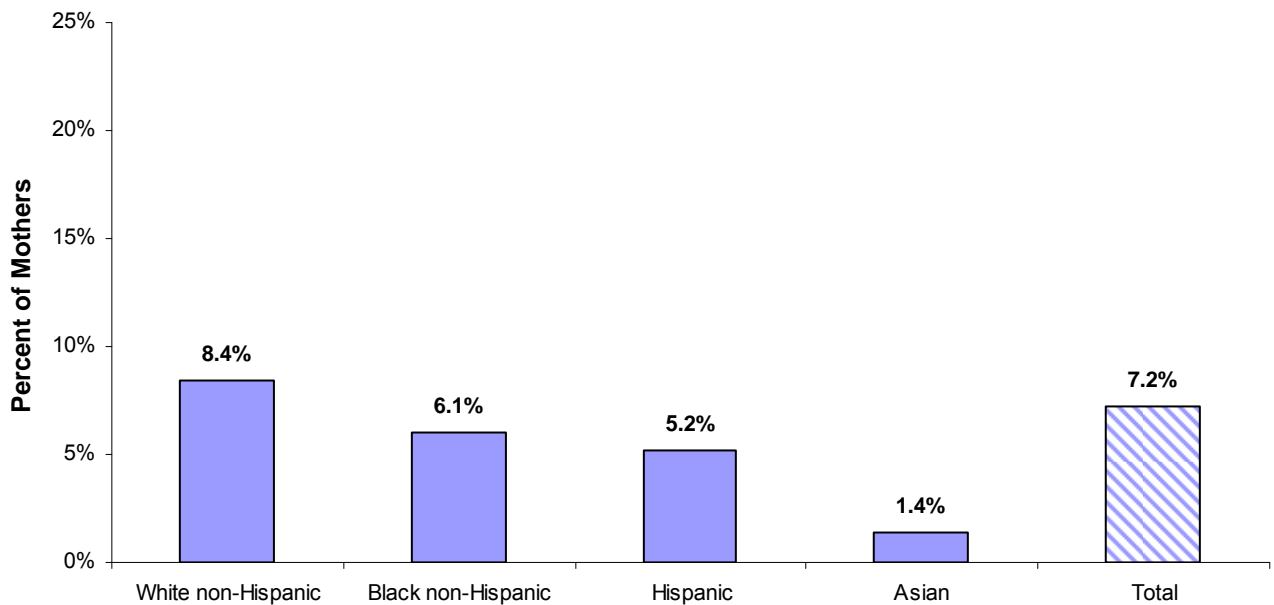
1. A clinical estimate of the number of weeks of pregnancy completed; as estimated by the attendant at birth or the postnatal physician. 2. Percentages are based on column total. 3. Other races include American Indian and others not specified. 4. Normal gestational age is defined as 37-42 weeks. 5. Estimate of gestational age not provided. 6. Also known as extremely premature delivery, or extremely preterm delivery.

7. Also known as early gestational age, premature delivery, or preterm delivery. 8. Calculations based on fewer than five events are excluded.

**Figure 3. Percent of Mothers who Smoked During Pregnancy<sup>1</sup>,  
Massachusetts: 1990-2005**



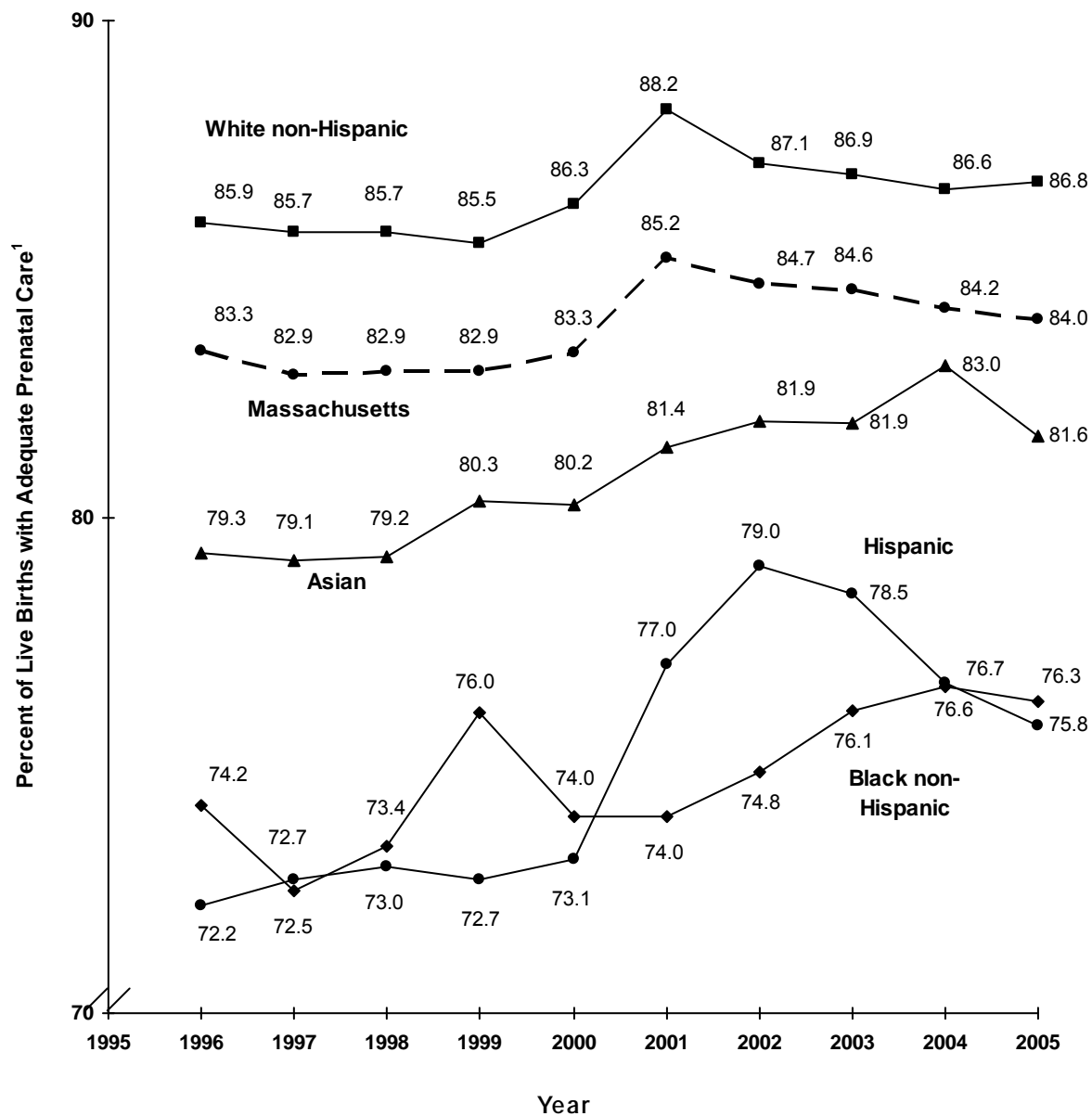
**Figure 4. Percent of Mothers who Smoked During Pregnancy<sup>1</sup>, by Mother's  
Race/Hispanic Ethnicity, Massachusetts: 2005**



NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.

1. Based on information provided on the birth certificate as reported by the mother. Due to self-reported nature, data on smoking prevalence should be interpreted cautiously. Mothers with more than one delivery are counted for each birth. 2. Caution should be used with Asian data because of small numbers.

**Figure 5. Trends in Adequacy of Prenatal Care<sup>1</sup> by Race and Hispanic Ethnicity, Massachusetts: 1996-2005**

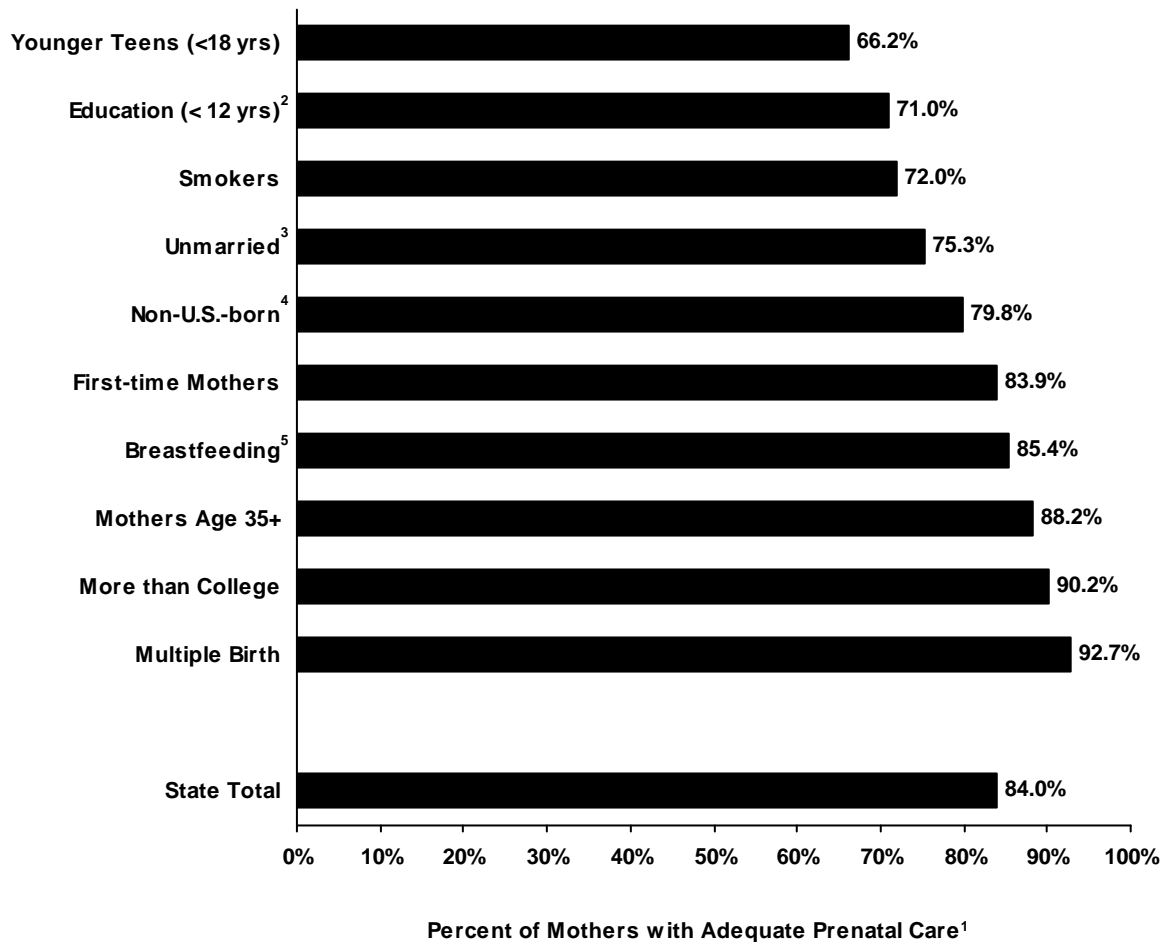


PLEASE NOTE THAT THE VERTICAL SCALE OF GRAPH REPRESENTS A SMALL INTERVAL (from 70% to 90%) FOR PURPOSES OF VISUAL REPRESENTATION.

NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.

1. Based on the Adequacy of Prenatal Care Utilization (APNCU) Index. Please note: The APNCU is an assessment of the timing and number of prenatal care visits and not an evaluation of the quality of care delivered.

**Figure 6. Adequacy of Prenatal Care<sup>1</sup> for Selected Maternal Characteristics, Massachusetts: 2005**

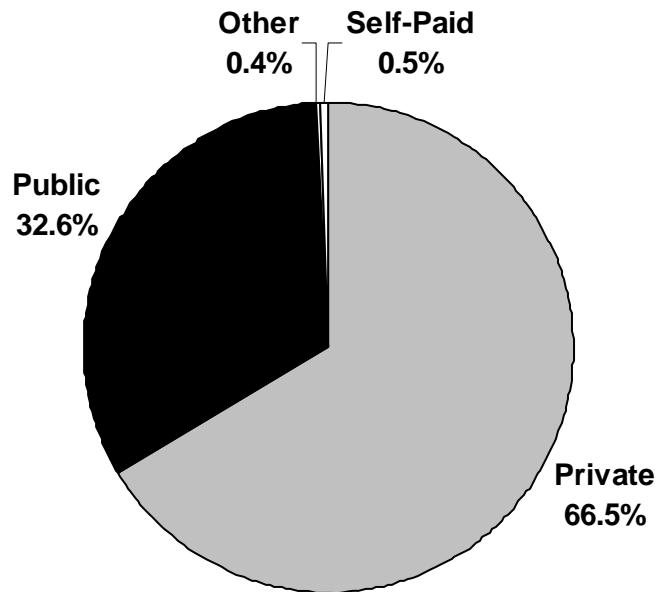


NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated. Characteristics of interest are not mutually exclusive, except as noted.

1. Based on the Adequacy of Prenatal Care Utilization (APNCU) Index. 2. Women 20 years of age and older. 3. Marital status at time of birth. 4. Non-U.S.-born includes women born outside of the 50 U.S. states, District of Columbia, and U.S. territories (Puerto Rico, U.S. Virgin Islands, Guam). 5. Mother was or was intending to breastfeed at the time the birth certificate was completed.



**Figure 7. Distribution of Prenatal Care Payment Source<sup>1</sup>, Massachusetts: 2005**



---

NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.

1. Private: Commercial indemnity plan, commercial managed care (HMO, PPO, IPP, IPA, and other), or other private insurance. Public: Government programs including Commonhealth, Healthy Start, Medicaid/MassHealth, and Medicare (may also be HMO or managed care), or free care. Other: Worker's Compensation and other sources.

**Table 11. Trends in Infant, Neonatal, and Post Neonatal Mortality, by Race and Hispanic Ethnicity, Massachusetts: 1990-2005**

**INFANT MORTALITY (less than one year of age)**

| Year | State Total <sup>1</sup> |                   | White non-Hispanic |                   | Black non-Hispanic |                   | Hispanic |                   | Asian |                   | Other <sup>2</sup> |                   |
|------|--------------------------|-------------------|--------------------|-------------------|--------------------|-------------------|----------|-------------------|-------|-------------------|--------------------|-------------------|
|      | n                        | Rate <sup>3</sup> | n                  | Rate <sup>3</sup> | n                  | Rate <sup>3</sup> | n        | Rate <sup>3</sup> | n     | Rate <sup>3</sup> | n                  | Rate <sup>3</sup> |
| 1990 | 649                      | 7.0               | 442                | 6.1               | 98                 | 13.7              | 77       | 9.1               | 24    | 7.0               | 8                  | 9.5               |
| 1991 | 577                      | 6.5               | 381                | 5.5               | 101                | 15.0              | 80       | 9.4               | 14    | 4.2               | 1                  | -- <sup>4</sup>   |
| 1992 | 569                      | 6.5               | 371                | 5.5               | 110                | 16.4              | 67       | 7.9               | 16    | 4.9               | 5                  | 5.1               |
| 1993 | 523                      | 6.2               | 346                | 5.3               | 84                 | 13.1              | 77       | 9.3               | 13    | 3.9               | 3                  | -- <sup>4</sup>   |
| 1994 | 499                      | 6.0               | 343                | 5.3               | 79                 | 12.6              | 64       | 7.6               | 8     | 2.4               | 5                  | 5.3               |
| 1995 | 419                      | 5.1               | 275                | 4.4               | 65                 | 11.1              | 58       | 7.2               | 19    | 5.5               | 2                  | -- <sup>4</sup>   |
| 1996 | 403                      | 5.0               | 289                | 4.7               | 63                 | 11.4              | 40       | 5.1               | 8     | 2.2               | 2                  | -- <sup>4</sup>   |
| 1997 | 425                      | 5.3               | 294                | 4.8               | 64                 | 11.7              | 55       | 6.7               | 10    | 2.6               | 2                  | -- <sup>4</sup>   |
| 1998 | 414                      | 5.1               | 287                | 4.6               | 59                 | 10.6              | 58       | 6.7               | 10    | 2.7               | 0                  | 0.0               |
| 1999 | 418                      | 5.2               | 285                | 4.7               | 72                 | 12.3              | 49       | 5.5               | 8     | 1.9               | 4                  | -- <sup>4</sup>   |
| 2000 | 377                      | 4.6               | 232                | 3.8               | 74                 | 12.8              | 48       | 5.2               | 19    | 4.1               | 4                  | -- <sup>4</sup>   |
| 2001 | 407                      | 5.0               | 245                | 4.1               | 71                 | 12.1              | 69       | 7.3               | 15    | 3.1               | 7                  | 4.1               |
| 2002 | 397                      | 4.9               | 239                | 4.1               | 69                 | 11.6              | 67       | 7.0               | 16    | 3.0               | 6                  | 3.8               |
| 2003 | 383                      | 4.8               | 235                | 4.1               | 75                 | 12.7              | 55       | 5.6               | 14    | 2.7               | 4                  | -- <sup>4</sup>   |
| 2004 | 376                      | 4.8               | 210                | 3.8               | 70                 | 11.5              | 75       | 7.6               | 15    | 2.7               | 6                  | 3.5               |
| 2005 | 391                      | 5.1               | 230                | 4.3               | 57                 | 9.4               | 78       | 7.7               | 18    | 3.4               | 8                  | 4.3               |

**NEONATAL MORTALITY (birth to 27 days)**

| Year | State Total <sup>1</sup> |                   | White non-Hispanic |                   | Black non-Hispanic |                   | Hispanic |                   | Asian |                   | Other <sup>2</sup> |                   |
|------|--------------------------|-------------------|--------------------|-------------------|--------------------|-------------------|----------|-------------------|-------|-------------------|--------------------|-------------------|
|      | n                        | Rate <sup>3</sup> | n                  | Rate <sup>3</sup> | n                  | Rate <sup>3</sup> | n        | Rate <sup>3</sup> | n     | Rate <sup>3</sup> | n                  | Rate <sup>3</sup> |
| 1990 | 446                      | 4.8               | 298                | 4.1               | 75                 | 10.5              | 49       | 5.8               | 19    | 5.5               | 5                  | 5.5               |
| 1991 | 401                      | 4.5               | 266                | 3.9               | 72                 | 10.7              | 53       | 6.2               | 10    | 3.0               | 0                  | 0.0               |
| 1992 | 415                      | 4.8               | 274                | 4.0               | 76                 | 11.4              | 51       | 6.0               | 10    | 3.0               | 4                  | -- <sup>4</sup>   |
| 1993 | 375                      | 4.4               | 245                | 3.7               | 64                 | 10.0              | 55       | 6.7               | 9     | 2.7               | 2                  | -- <sup>4</sup>   |
| 1994 | 349                      | 4.2               | 240                | 3.7               | 58                 | 9.3               | 40       | 4.7               | 7     | 2.1               | 4                  | -- <sup>4</sup>   |
| 1995 | 298                      | 3.6               | 198                | 3.1               | 50                 | 8.5               | 39       | 4.8               | 10    | 2.9               | 1                  | -- <sup>4</sup>   |
| 1996 | 290                      | 3.6               | 222                | 3.6               | 34                 | 6.2               | 27       | 3.5               | 5     | 1.4               | 1                  | -- <sup>4</sup>   |
| 1997 | 323                      | 4.0               | 228                | 3.7               | 44                 | 8.0               | 43       | 5.2               | 7     | 1.8               | 1                  | -- <sup>4</sup>   |
| 1998 | 315                      | 3.9               | 218                | 3.5               | 47                 | 8.5               | 43       | 5.0               | 7     | 1.9               | 0                  | 0.0               |
| 1999 | 332                      | 4.1               | 226                | 3.7               | 58                 | 9.9               | 39       | 4.4               | 5     | 1.2               | 4                  | -- <sup>4</sup>   |
| 2000 | 288                      | 3.5               | 177                | 2.9               | 57                 | 9.9               | 37       | 4.0               | 14    | 3.0               | 3                  | -- <sup>4</sup>   |
| 2001 | 308                      | 3.8               | 190                | 3.2               | 56                 | 9.5               | 49       | 5.2               | 10    | 2.1               | 3                  | -- <sup>4</sup>   |
| 2002 | 299                      | 3.7               | 185                | 3.2               | 49                 | 8.2               | 50       | 5.2               | 13    | 2.4               | 2                  | -- <sup>4</sup>   |
| 2003 | 285                      | 3.6               | 179                | 3.1               | 56                 | 9.5               | 38       | 3.9               | 10    | 1.9               | 2                  | -- <sup>4</sup>   |
| 2004 | 291                      | 3.7               | 167                | 3.0               | 51                 | 8.4               | 57       | 5.8               | 12    | 2.2               | 4                  | -- <sup>4</sup>   |
| 2005 | 282                      | 3.7               | 168                | 3.1               | 40                 | 6.6               | 57       | 5.8               | 11    | 2.1               | 5                  | 2.7               |

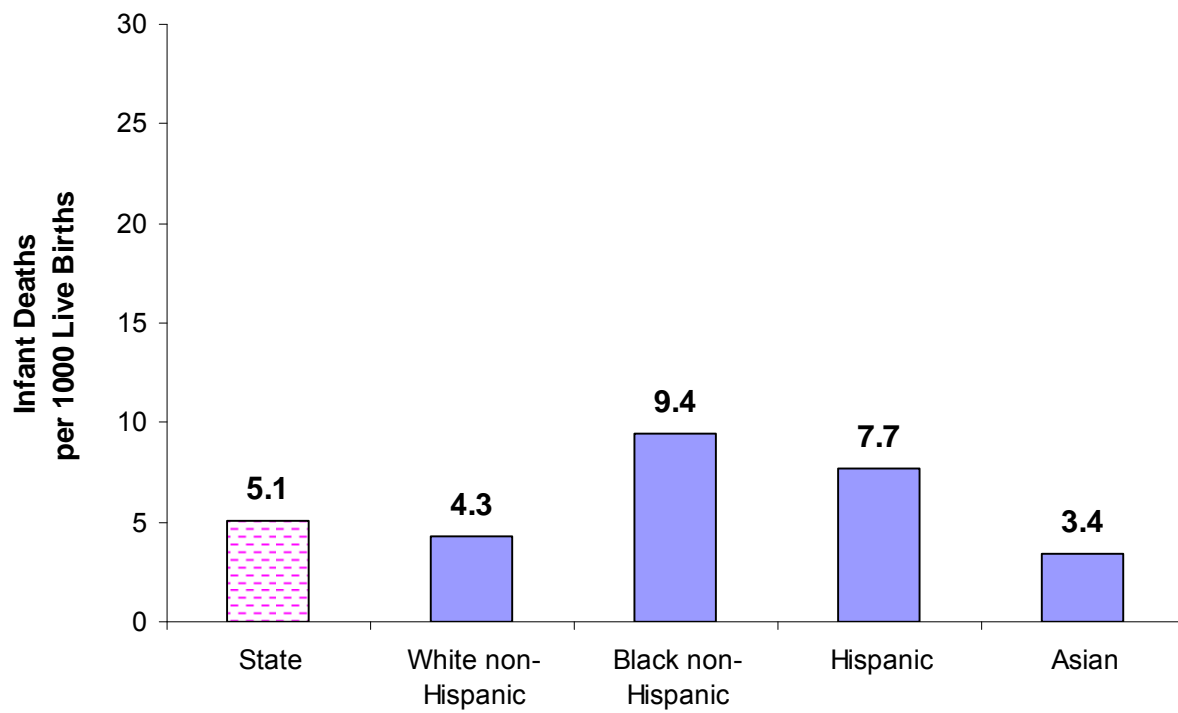
**Table 11 (cont.). Trends in Infant, Neonatal, and Post Neonatal Mortality, by Race and Hispanic Ethnicity, Massachusetts: 1990-2005**

**POST NEONATAL MORTALITY (28-364 days)**

| Year | State Total <sup>1</sup> |                   | White non-Hispanic |                   | Black non-Hispanic |                   | Hispanic |                   | Asian |                   | Other <sup>2</sup> |                   |
|------|--------------------------|-------------------|--------------------|-------------------|--------------------|-------------------|----------|-------------------|-------|-------------------|--------------------|-------------------|
|      | n                        | Rate <sup>3</sup> | n                  | Rate <sup>3</sup> | n                  | Rate <sup>3</sup> | n        | Rate <sup>3</sup> | n     | Rate <sup>3</sup> | n                  | Rate <sup>3</sup> |
| 1990 | 203                      | 2.2               | 144                | 2.0               | 23                 | 3.2               | 28       | 3.3               | 5     | 1.5               | 3                  | -- <sup>4</sup>   |
| 1991 | 176                      | 2.0               | 115                | 1.7               | 29                 | 4.3               | 27       | 3.2               | 4     | -- <sup>4</sup>   | 1                  | -- <sup>4</sup>   |
| 1992 | 154                      | 1.8               | 97                 | 1.4               | 34                 | 5.1               | 16       | 1.9               | 6     | 1.8               | 1                  | -- <sup>4</sup>   |
| 1993 | 148                      | 1.7               | 101                | 1.5               | 20                 | 3.1               | 22       | 2.7               | 4     | -- <sup>4</sup>   | 1                  | -- <sup>4</sup>   |
| 1994 | 150                      | 1.8               | 103                | 1.6               | 21                 | 3.3               | 24       | 2.8               | 1     | -- <sup>4</sup>   | 1                  | -- <sup>4</sup>   |
| 1995 | 121                      | 1.5               | 77                 | 1.2               | 15                 | 2.6               | 19       | 2.3               | 9     | 2.6               | 1                  | -- <sup>4</sup>   |
| 1996 | 113                      | 1.4               | 67                 | 1.1               | 29                 | 5.3               | 13       | 1.7               | 3     | -- <sup>4</sup>   | 1                  | -- <sup>4</sup>   |
| 1997 | 102                      | 1.3               | 66                 | 1.1               | 20                 | 3.7               | 12       | 1.5               | 3     | -- <sup>4</sup>   | 1                  | -- <sup>4</sup>   |
| 1998 | 99                       | 1.2               | 69                 | 1.1               | 12                 | 2.2               | 15       | 1.7               | 3     | -- <sup>4</sup>   | 0                  | 0.0               |
| 1999 | 86                       | 1.1               | 59                 | 1.0               | 14                 | 2.4               | 10       | 1.1               | 3     | -- <sup>4</sup>   | 0                  | 0.0               |
| 2000 | 89                       | 1.1               | 55                 | 0.9               | 17                 | 2.9               | 11       | 1.2               | 5     | 1.1               | 1                  | -- <sup>4</sup>   |
| 2001 | 99                       | 1.2               | 55                 | 0.9               | 15                 | 2.6               | 20       | 2.1               | 5     | 1.0               | 4                  | -- <sup>4</sup>   |
| 2002 | 98                       | 1.2               | 54                 | 0.9               | 20                 | 3.4               | 17       | 1.8               | 3     | -- <sup>4</sup>   | 4                  | -- <sup>4</sup>   |
| 2003 | 98                       | 1.2               | 56                 | 1.0               | 19                 | 3.2               | 17       | 1.7               | 4     | -- <sup>4</sup>   | 2                  | -- <sup>4</sup>   |
| 2004 | 85                       | 1.1               | 43                 | 0.8               | 19                 | 3.1               | 18       | 1.8               | 3     | -- <sup>4</sup>   | 2                  | -- <sup>4</sup>   |
| 2005 | 109                      | 1.4               | 62                 | 1.2               | 17                 | 2.8               | 20       | 2.0               | 7     | 1.3               | 3                  | -- <sup>4</sup>   |

1. Deaths of infants of unknown race are included in the total calculation. For rate computations, births of infants of unknown race are allocated into the race categories according to the distribution of births of known race. 2. Other: American Indian and Other races. 3. Rates are expressed per 1,000 live births. 4. Calculations based on fewer than five events are excluded.

**Figure 8. Infant Mortality Rates by Race and Hispanic Ethnicity,  
Massachusetts: 2005**



**Table 12. Resident Birth Characteristics, 30 Largest Municipalities, Massachusetts: 2005**

| Municipality <sup>1</sup> | Rank<br>(by pop.<br>size) | Population | Crude Birth<br>Rate <sup>2</sup> | Mother's Race and Ethnicity |                        |                |                                | Very Low<br>Birthweight<br>(<1500 g) | Low<br>Birthweight<br>(<2500 g) |
|---------------------------|---------------------------|------------|----------------------------------|-----------------------------|------------------------|----------------|--------------------------------|--------------------------------------|---------------------------------|
|                           |                           |            |                                  | White non-<br>Hispanic      | Black non-<br>Hispanic | Hispanic       | Asian or<br>Other <sup>4</sup> |                                      |                                 |
|                           |                           |            |                                  | % <sup>3</sup>              | % <sup>3</sup>         | % <sup>3</sup> | % <sup>3</sup>                 |                                      |                                 |
| <b>STATE TOTAL</b>        |                           | 6,436,940  | <b>11.9</b>                      | <b>69.6</b>                 | <b>7.9</b>             | <b>13.1</b>    | <b>9.3</b>                     | <b>1.4</b>                           | <b>7.9</b>                      |
| Attleboro                 | 29                        | 43,364     | 14.3                             | 80.4                        | 2.9                    | 7.6            | 9.2                            | 1.3                                  | 8.5                             |
| Barnstable                | 25                        | 47,902     | 9.5                              | 81.5                        | 5.3                    | 4.2            | 8.8                            | 1.3                                  | 6.2                             |
| Boston                    | 1                         | 558,435    | 13.5                             | 35.7                        | 28.8                   | 21.2           | 14.2                           | 2.1                                  | 9.6                             |
| Brockton                  | 6                         | 100,366    | 15.4                             | 35.0                        | 38.2                   | 12.3           | 14.5                           | 2.3                                  | 11.5                            |
| Brookline                 | 18                        | 56,422     | 10.9                             | 71.0                        | 3.1                    | 3.4            | 22.3                           | 1.6                                  | 6.0                             |
| Cambridge                 | 5                         | 101,529    | 10.1                             | 57.2                        | 15.0                   | 8.6            | 19.1                           | 0.5                                  | 7.2                             |
| Chicopee                  | 21                        | 54,599     | 11.1                             | 77.0                        | 2.8                    | 16.8           | 3.5                            | 1.2                                  | 6.9                             |
| Fall River                | 9                         | 92,117     | 13.0                             | 80.0                        | 7.4                    | 7.8            | 4.8                            | 1.4                                  | 7.9                             |
| Framingham                | 14                        | 65,651     | 15.3                             | 68.3                        | 6.1                    | 14.8           | 10.8                           | 1.8                                  | 8.0                             |
| Haverhill                 | 15                        | 60,032     | 13.7                             | 76.6                        | 2.9                    | 16.3           | 4.2                            | 1.1                                  | 7.9                             |
| Lawrence                  | 12                        | 81,591     | 17.9                             | 15.7                        | 2.7                    | 78.5           | 3.2                            | 2.6                                  | 9.0                             |
| Leominster                | 30                        | 42,120     | 12.2                             | 67.7                        | 6.4                    | 19.3           | 6.6                            | 1.2                                  | 5.5                             |
| Lowell                    | 4                         | 105,749    | 15.8                             | 45.3                        | 7.3                    | 19.3           | 28.0                           | 1.2                                  | 9.2                             |
| Lynn                      | 8                         | 92,186     | 16.1                             | 36.2                        | 13.7                   | 39.3           | 10.7                           | 1.4                                  | 8.3                             |
| Malden                    | 17                        | 56,730     | 14.0                             | 46.7                        | 17.9                   | 11.6           | 23.5                           | 2.8                                  | 9.6                             |
| Medford                   | 22                        | 53,801     | 11.3                             | 73.3                        | 11.2                   | 3.8            | 11.7                           | 1.5                                  | 7.8                             |
| Methuen                   | 27                        | 44,532     | 13.1                             | 69.8                        | 2.9                    | 23.0           | 4.3                            | 1.0                                  | 6.5                             |
| New Bedford               | 7                         | 94,502     | 14.7                             | 63.8                        | 6.5                    | 21.4           | 8.3                            | 1.8                                  | 10.6                            |
| Newton                    | 11                        | 83,346     | 9.5                              | 77.4                        | 2.2                    | 4.1            | 16.4                           | 0.6                                  | 6.5                             |
| Peabody                   | 24                        | 50,954     | 9.5                              | 84.6                        | 3.1                    | 7.8            | 4.5                            | 1.9                                  | 9.7                             |
| Pittsfield                | 28                        | 43,949     | 12.0                             | 80.6                        | 6.5                    | 8.2            | 4.6                            | -- <sup>5</sup>                      | 8.4                             |
| Plymouth                  | 20                        | 54,781     | 12.0                             | 92.4                        | 1.5                    | 1.8            | 4.1                            | 1.1                                  | 8.5                             |
| Quincy                    | 10                        | 90,458     | 12.6                             | 58.6                        | 5.7                    | 4.6            | 30.9                           | 0.7                                  | 7.3                             |
| Revere                    | 26                        | 45,551     | 14.1                             | 50.3                        | 4.5                    | 30.8           | 14.2                           | 1.9                                  | 10.9                            |
| Somerville                | 13                        | 75,372     | 12.0                             | 63.0                        | 9.0                    | 16.1           | 11.9                           | 0.8                                  | 6.5                             |
| Springfield               | 3                         | 156,358    | 15.2                             | 28.0                        | 20.1                   | 47.0           | 4.7                            | 2.2                                  | 9.8                             |
| Taunton                   | 19                        | 56,348     | 13.1                             | 80.5                        | 7.1                    | 4.3            | 7.9                            | 1.8                                  | 9.5                             |
| Waltham                   | 16                        | 59,564     | 12.3                             | 53.9                        | 7.0                    | 21.8           | 17.2                           | 0.7                                  | 7.9                             |
| Weymouth                  | 23                        | 53,708     | 13.1                             | 86.9                        | 2.9                    | 1.4            | 8.6                            | 1.4                                  | 7.7                             |
| Worcester                 | 2                         | 179,839    | 14.4                             | 59.1                        | 12.3                   | 20.7           | 7.8                            | 2.2                                  | 8.3                             |

**Table 12 (cont'd). Resident Birth Characteristics, 30 Largest Municipalities, Massachusetts: 2005**

| Municipality <sup>1</sup> | Birth                               |   |           |                             |                   | Deaths                             |           |                                      |                 |
|---------------------------|-------------------------------------|---|-----------|-----------------------------|-------------------|------------------------------------|-----------|--------------------------------------|-----------------|
|                           | Adequate Prenatal Care <sup>6</sup> | Public Payment <sup>7</sup> for Prenatal Care | Unmarried | Teen Mothers 15 to 19 years |                   | Infant Mortality Rate <sup>8</sup> |           | Neonatal Mortality Rate <sup>8</sup> |                 |
|                           | %                                   | %   | %         | n                           | Rate <sup>2</sup> | 2005                               | 2003-2005 | 2005                                 | 2003-2005       |
| STATE TOTAL               | 84.0                                | 32.6  | 30.2      | 4,539                       | 21.7              | 5.1                                | 4.9       | 3.7                                  | 3.6             |
| Attleboro                 | 77.6                                | 26.3  | 23.8      | 29                          | 25.6              | -- <sup>5</sup>                    | 3.2       | -- <sup>5</sup>                      | 2.7             |
| Barnstable                | 89.2                                | 44.9  | 33.0      | 29                          | 21.3              | -- <sup>5</sup>                    | 6.6       | -- <sup>5</sup>                      | 4.4             |
| Boston                    | 84.1                                | 46.8  | 44.9      | 566                         | 28.6              | 5.2                                | 5.8       | 4.2                                  | 4.5             |
| Brockton                  | 74.6                                | 60.8  | 52.8      | 148                         | 40.7              | 6.5                                | 7.6       | 5.8                                  | 5.8             |
| Brookline                 | 94.7                                | 5.6   | 6.0       | -- <sup>5</sup>             | -- <sup>5</sup>   | -- <sup>5</sup>                    | 3.5       | -- <sup>5</sup>                      | 3.0             |
| Cambridge                 | 89.5                                | 17.0  | 15.2      | 20                          | 5.1               | -- <sup>5</sup>                    | 2.8       | -- <sup>5</sup>                      | 2.2             |
| Chicopee                  | 82.9                                | 51.1  | 45.4      | 72                          | 41.4              | -- <sup>5</sup>                    | 6.6       | -- <sup>5</sup>                      | 3.3             |
| Fall River                | 85.7                                | 61.9  | 50.8      | 140                         | 49.5              | 7.5                                | 6.0       | -- <sup>5</sup>                      | 3.6             |
| Framingham                | 86.6                                | 36.6  | 25.3      | 45                          | 23.0              | 6.0                                | 6.4       | 5.0                                  | 5.1             |
| Haverhill                 | 86.8                                | 31.2  | 33.1      | 59                          | 30.9              | -- <sup>5</sup>                    | 3.1       | -- <sup>5</sup>                      | 1.9             |
| Lawrence                  | 71.1                                | 70.5  | 64.5      | 217                         | 71.7              | 7.5                                | 7.5       | 6.2                                  | 5.9             |
| Leominster                | 84.0                                | 36.0  | 35.0      | 22                          | 17.5              | -- <sup>5</sup>                    | 5.0       | -- <sup>5</sup>                      | 3.8             |
| Lowell                    | 68.2                                | 54.6  | 51.3      | 204                         | 51.4              | 6.6                                | 7.8       | 3.0                                  | 5.0             |
| Lynn                      | 73.8                                | 63.8  | 50.7      | 146                         | 47.3              | -- <sup>5</sup>                    | 5.9       | -- <sup>5</sup>                      | 4.5             |
| Malden                    | 84.1                                | 44.2  | 29.5      | 23                          | 16.1              | 11.4                               | 5.7       | 11.4                                 | 5.7             |
| Medford                   | 87.1                                | 26.5  | 20.3      | 13                          | 7.3               | -- <sup>5</sup>                    | 4.4       | -- <sup>5</sup>                      | 3.3             |
| Methuen                   | 83.2                                | 23.9  | 28.4      | 36                          | 27.1              | -- <sup>5</sup>                    | 3.3       | -- <sup>5</sup>                      | -- <sup>5</sup> |
| New Bedford               | 77.4                                | 59.2  | 60.0      | 174                         | 58.9              | 8.6                                | 6.9       | 5.0                                  | 4.2             |
| Newton                    | 88.5                                | 6.1   | 5.8       | -- <sup>5</sup>             | -- <sup>5</sup>   | -- <sup>5</sup>                    | 3.8       | -- <sup>5</sup>                      | 3.8             |
| Peabody                   | 81.0                                | 28.2  | 23.0      | 15                          | 10.5              | -- <sup>5</sup>                    | 3.9       | -- <sup>5</sup>                      | 3.9             |
| Pittsfield                | 61.0                                | 53.0  | 47.6      | 67                          | 52.7              | -- <sup>5</sup>                    | 5.7       | -- <sup>5</sup>                      | 3.1             |
| Plymouth                  | 86.3                                | 17.6  | 19.1      | 26                          | 15.6              | -- <sup>5</sup>                    | 4.8       | -- <sup>5</sup>                      | 3.8             |
| Quincy                    | 86.4                                | 33.0  | 26.6      | 48                          | 23.1              | 4.4                                | 4.6       | -- <sup>5</sup>                      | 3.4             |
| Revere                    | 81.2                                | 58.1  | 37.5      | 48                          | 45.6              | 10.9                               | 5.4       | 10.9                                 | 5.4             |
| Somerville                | 83.2                                | 40.7  | 32.0      | 37                          | 17.1              | -- <sup>5</sup>                    | 3.7       | -- <sup>5</sup>                      | 3.4             |
| Springfield               | 71.6                                | 70.9  | 67.7      | 435                         | 71.6              | 10.6                               | 7.1       | 8.0                                  | 4.7             |
| Taunton                   | 78.1                                | 41.2  | 41.8      | 53                          | 32.5              | 8.1                                | 5.3       | -- <sup>5</sup>                      | 3.5             |
| Waltham                   | 82.1                                | 28.4  | 22.2      | 22                          | 9.4               | 0.0                                | 2.3       | 0.0                                  | 2.3             |
| Weymouth                  | 88.8                                | 25.8  | 24.1      | 22                          | 15.2              | 8.6                                | 7.5       | 7.1                                  | 6.6             |
| Worcester                 | 82.7                                | 47.0  | 45.8      | 262                         | 37.2              | 13.9                               | 8.3       | 11.6                                 | 6.4             |

NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.

1. The 30 largest municipalities are the cities and towns in Massachusetts with the largest populations according to DPH 2005 Massachusetts (Department of Public Health) Modified Age, Race/Ethnicity, & Sex Estimates 2005 (MMARS05), released October, 2006 (see Technical Notes in Appendix). 2. Crude birth rates represent the number of births per 1,000 residents; teen birth rates refer to the number of births per 1,000 females ages 15-19. 3. For the category of Mother's Race and Ethnicity, percentages are calculated based on the state total of resident births, including births for which mother's race/Hispanic ethnicity is unknown. 4. Mothers who designated themselves as Asian, American Indian or Other. 5. Calculations based on fewer than 5 events are excluded. 6. Based on the Adequacy of Prenatal Care Utilization (APNCU) Index. Please see Glossary for definition. 7. Public payment sources include Commonhealth, Healthy Start, Medicaid/MassHealth, and Medicare (may be HMO or managed care), or free care. 8. Deaths per 1,000 live births. See Definitions of Rates section in Appendix for definitions of infant and neonatal mortality rates.

**Table 13. Birth Characteristics by Licensed Maternity Facility<sup>1</sup>, Massachusetts: 2005**

| Facility  | Location            | Occurrence<br>Births <sup>2</sup> (n) | Low<br>Birthweight <sup>3</sup><br>(%) | Public<br>Payment for<br>Delivery <sup>4</sup> (%) | Adequate<br>Prenatal<br>Care <sup>5</sup> (%) | C-Section <sup>6</sup><br>(%) |
|---|---------------------|---------------------------------------|--|--|---|-------------------------------|
| <b>State Total</b>                                      |                     | <b>77,841</b>                         | <b>7.9</b>                             | <b>31.8</b>  | <b>84.1</b>                                   | <b>32.5</b>                   |
| Anna Jaques Hospital                                    | Newburyport         | 710                                   | 4.4                                    | 18.6   | 91.0  | 33.2                          |
| Baystate Medical Center                                 | Springfield         | 4,112                                 | 13.0                                   | 45.5   | 78.6  | 30.2                          |
| Berkshire Medical Center                                | Pittsfield          | 771                                   | 6.7                                    | 43.0   | 62.8  | 30.4                          |
| Beth Israel Deaconess<br>Medical Center                 | Boston              | 4,873                                 | 12.0                                   | 16.9   | 95.3  | 42.4                          |
| Beverly Hospital  | Beverly             | 2,068                                 | 5.4                                    | 25.2   | 93.4  | 33.5                          |
| Boston Medical Center                                   | Boston              | 2,290                                 | 11.0                                   | 83.3   | 54.0  | 30.1                          |
| Brigham and Women's<br>Hospital                         | Boston              | 8,382                                 | 11.0                                   | 18.8   | 97.5  | 32.8                          |
| Brockton Hospital                                       | Brockton            | 1,378                                 | 8.1                                    | 63.8   | 83.2  | 34.8                          |
| Cambridge Birth Center                                  | Cambridge           | 103                                   | -- <sup>7</sup>                        | 30.4   | 67.6  | 0.0                           |
| Cambridge Hospital                                      | Cambridge           | 1,180                                 | 2.0                                    | 73.2   | 76.5  | 28.3                          |
| Cape Cod Hospital                                       | Barnstable          | 1,009                                 | 4.4                                    | 40.9   | 89.7  | 27.6                          |
| Caritas Good Samaritan<br>Medical Center                | Brockton            | 958                                   | 6.6                                    | 47.4   | 57.6  | 38.4                          |
| Caritas Holy Family<br>Hospital And Medical<br>Center   | Methuen             | 1,323                                 | 4.4                                    | 21.2   | 86.1  | 41.2                          |
| Caritas St. Elizabeth's<br>Medical Center Of Boston     | Boston              | 1,345                                 | 15.0                                   | 19.0   | 76.7  | 37.6                          |
| Charlton Memorial Hospital                              | Fall River          | 1,647                                 | 5.4                                    | 47.2   | 87.8  | 33.8                          |
| Cooley Dickinson Hospital                               | Northampton         | 830                                   | 3.3                                    | 24.8   | 91.0  | 25.4                          |
| Emerson Hospital  | Concord             | 1,168                                 | 3.5                                    | 6.2  | 84.7  | 36.6                          |
| Fairview Hospital                                       | Great<br>Barrington | 160                                   | 3.8                                    | 48.1   | 83.6  | 31.3                          |
| Falmouth Hospital                                       | Falmouth            | 637                                   | 4.3                                    | 27.3   | 82.0  | 32.3                          |
| Franklin Medical Center                                 | Greenfield          | 458                                   | 5.0                                    | 43.3   | 84.5  | 27.5                          |
| Harrington Memorial<br>Hospital                         | Southbridge         | 424                                   | 3.6                                    | 50.1   | 88.7  | 30.6                          |
| Heywood Memorial Hospital                               | Gardner             | 565                                   | 3.7                                    | 36.9   | 81.5  | 21.6                          |
| Holyoke Hospital  | Holyoke             | 620                                   | 4.4                                    | 66.6   | 77.3  | 20.3                          |
| Jordan Hospital   | Plymouth            | 620                                   | 4.4                                    | 26.8   | 84.7  | 34.5                          |
| Lawrence General Hospital                               | Lawrence            | 1,739                                 | 5.8                                    | 60.6   | 74.9  | 29.2                          |
| Leominster Hospital                                     | Leominster          | 1,153                                 | 3.1                                    | 44.2   | 82.6  | 24.1                          |
| Lowell General Hospital                                 | Lowell              | 1,850                                 | 6.3                                    | 40.9   | 65.8  | 31.6                          |
| Martha's Vineyard Hospital                              | Oak Bluffs          | 152                                   | -- <sup>7</sup>                        | 36.8   | 92.1  | 23.7                          |
| Mary Lane Hospital                                      | Ware                | 188                                   | 3.2                                    | 50.8   | 77.1  | 35.6                          |
| Massachusetts General<br>Hospital                       | Boston              | 3,500                                 | 8.7                                    | 33.9   | 86.6  | 31.9                          |
| Melrose-Wakefield Hospital                              | Melrose             | 1,267                                 | 5.9                                    | 25.3   | 90.5  | 41.0                          |
| Mercy Medical Center                                    | Springfield         | 1,416                                 | 3.6                                    | 55.9   | 81.0  | 22.6                          |
| Metrowest Medical Center-<br>Framingham Union<br>Campus | Framingham          | 2,018                                 | 5.8                                    | 31.2   | 91.8  | 36.4                          |
| Milford Regional Medical<br>Center                      | Milford             | 915                                   | 4.3                                    | 23.5   | 90.9  | 35.4                          |
| Morton Hospital   | Taunton             | 469                                   | 8.0                                    | 47.1   | 71.6  | 38.1                          |
| Mount Auburn Hospital                                   | Cambridge           | 1,812                                 | 4.1                                    | 18.2   | 89.9  | 24.4                          |
| Nantucket Cottage Hospital                              | Nantucket           | 111                                   | -- <sup>7</sup>                        | 45.0   | 82.9  | 27.9                          |

**Table 13 (cont.). Birth Characteristics by Licensed Maternity Facility<sup>1</sup>, Massachusetts: 2005**

| Facility                                    | Location    | Occurrence Births <sup>2</sup> (n) | Low Birthweight <sup>3</sup> (%) | Public Payment for Delivery <sup>4</sup> (%) | Adequate Prenatal Care <sup>5</sup> (%) | C-Section <sup>6</sup> (%) |
|---|-------------|------------------------------------|----------------------------------|--|---|----------------------------|
| Newton Wellesley Hospital                   | Newton      | 3,182                              | 5.8                              | 2.7  | 78.0                                    | 37.4                       |
| North Adams Regional Hospital               | North Adams | 294                                | 4.1                              | 49.0   | 91.2                                    | 26.5                       |
| North Shore Birth Center                    | Beverly     | 83                                 | 0.0                              | 19.3   | 92.7                                    | 0.0                        |
| North Shore Medical Center - Salem Hospital | Salem       | 1,914                              | 6.0                              | 46.7   | 67.9                                    | 31.8                       |
| Saint Vincent Hospital                      | Worcester   | 1,760                              | 5.5                              | 8.8  | 94.3                                    | 27.3                       |
| Saints Memorial Medical Ctr.                | Lowell      | 684                                | 5.3                              | 42.1   | 84.3                                    | 34.7                       |
| South Shore Hospital                        | Weymouth    | 3,790                              | 7.4                              | 13.2   | 89.9                                    | 37.5                       |
| Caritas Norwood Hospital                    | Norwood     | 557                                | 4.3                              | 20.9   | 67.0                                    | 36.3                       |
| St. Luke's Hospital                         | New Bedford | 1,605                              | 8.0                              | 52.8   | 78.6                                    | 28.5                       |
| Sturdy Memorial Hospital                    | Attleboro   | 1,076                              | 3.3                              | 21.3   | 71.9                                    | 36.4                       |
| The Birthplace at Wellesley <sup>8</sup>    | Wellesley   | 72                                 | -- <sup>7</sup>                  | 0.0  | 84.7                                    | 0.0                        |
| Tobey Hospital                              | Wareham     | 496                                | 3.0                              | 36.3   | 79.8                                    | 18.1                       |
| Tufts-New England Medical Center Hospital   | Boston      | 1,244                              | 27.0                             | 38.9   | 85.2                                    | 37.9                       |
| UMASS Memorial Medical Center - West Campus | Worcester   | 4,462                              | 11.0                             | 35.8   | 81.7                                    | 27.4                       |
| Winchester Hospital                         | Winchester  | 2,079                              | 5.3                              | 5.7  | 85.3                                    | 32.6                       |
| Other Hospitals                             |             | 6                                  | -- <sup>7</sup>                  | 33.3   | 83.3                                    | 16.7                       |
| Home, En route & Doctors' Offices           |             | 316                                | 9.4                              | 25.0   | 65.3                                    | 0.7                        |

NOTES: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.

1. A licensed maternity facility is a medical unit licensed by the Commonwealth for the care of women during pregnancy and childbirth. 2. See Glossary for definition of occurrence births. 3. Less than 2,500 grams (5.5 lbs.) 4. Public payment for delivery includes Medicaid/MassHealth, Commonwealth, Medicare, Healthy Start, other government programs, and free care. 5. Based on the APNCU Index. 6. The percentages provided in this row are based on occurrence births and may differ from data presented elsewhere in this book which are based on resident births. 7. Calculations based on values of 1-4 for medical characteristics of facilities with less than 200 births are suppressed based Guidelines for Release of Births Data, Center for Health Information, Statistics, Research and Evaluation, Massachusetts Department of Public Health. 8. The Birthplace at Wellesley closed on September 2005.



**Table 14. Comparison of Massachusetts Perinatal Health Indicators with Healthy People 2010 Objectives<sup>1</sup>, Massachusetts: 2002-2005**

| Healthy People 2010 Objectives<br>(Focus Area 16: Maternal, Infant<br>and Child Health <sup>2</sup> ) | HP2010<br>Target | Massachusetts |      |      |      | Has Massachusetts<br>achieved HP2010 target?<br>✓ = YES<br>○ = NO, but within 25% of<br>target<br>● = NO, > 25% from target |
|---|------------------|---------------|------|------|------|---|
|   |                  | 2002          | 2003 | 2004 | 2005 |   |
| <b>Fetal, Infant, and Maternal Deaths</b>   |                  |               |      |      |      |   |
| 16-1a. Fetal Mortality Rate <sup>3</sup>  | 4.1              | 4.6           | 5.7  | 5.3  | 5.5  | ●   |
| 16-1b. Perinatal Mortality Rate <sup>4</sup>  | 4.5              | 4.7           | 5.8  | 5.8  | 5.4  | ○   |
| 16-1c. Infant Mortality Rate <sup>5</sup>   | 4.5              | 4.9           | 4.8  | 4.7  | 5.1  | ○   |
| 16-1d. Neonatal Mortality Rate <sup>6</sup>   | 2.9              | 3.7           | 3.6  | 3.7  | 3.7  | ●   |
| 16-1e. Postneonatal Mortality Rate <sup>7</sup>   | 1.2              | 1.2           | 1.2  | 1.1  | 1.4  | ○   |
| 16-4. Maternal Mortality Ratio <sup>8</sup>   | 3.3              | 2.4           | 4.9  | 6.3  | 10.3 | ●   |
| <b>Risk Factors</b>   |                  |               |      |      |      |   |
| 16-10a. Low Birthweight <sup>9</sup> (%)  | 5.0              | 7.5           | 7.6  | 7.8  | 7.9  | ●   |
| 16-10b. Very Low Birthweight <sup>10</sup> (%)  | 0.9              | 1.4           | 1.4  | 1.5  | 1.4  | ●   |
| 16-11a. Preterm <sup>11</sup> (%)   | 7.6              | 8.5           | 8.7  | 9.2  | 9.0  | ○   |
| <b>Prenatal Care</b>  |                  |               |      |      |      |   |
| 16-6a. Care beginning in first trimester (%)  | 90.0             | 84.2          | 83.9 | 83.5 | 83.2 | ○   |
| 16-6b. Early and adequate care <sup>12</sup> (%)  | 90.0             | 85.0          | 84.5 | 84.2 | 84.0 | ○   |
| <b>Obstetrical Care</b>   |                  |               |      |      |      |   |
| 16-8. Very Low Birthweight <sup>10</sup> Infants born<br>at Level III Hospitals <sup>13</sup> (%)     | 90.0             | 81.2          | 79.1 | 80.1 | 78.5 | ○   |
| 16-9a. Cesarean Sections: Low-Risk <sup>14</sup><br>Women Giving Birth for the First Time (%)         | 15.0             | 24.0          | 25.0 | 26.7 | 27.8 | ●   |
| 16-9b. Cesarean Sections: Low-Risk <sup>14</sup><br>Women with Prior Cesarean Section (%)             | 63.0             | 84.2          | 86.7 | 87.9 | 89.8 | ●   |
| <b>Breastfeeding</b>  |                  |               |      |      |      |   |
| 16-19a. Breastfeeding <sup>15</sup> (%)   | 75.0             | 76.1          | 78.1 | 78.9 | 79.3 | ✓   |
| <b>Prenatal Substance Exposure</b>  |                  |               |      |      |      |   |
| 16-17c. Abstinence from Smoking (%)   | 99.0             | 92.1          | 92.3 | 92.6 | 92.8 | ○   |

NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.

1. National health promotion and disease prevention agenda established by the U.S. Dept. of Health and Human Services. 2. Goal: to improve the health and well-being of women, infants, children, and families. 3. Number of fetal deaths per 1,000 fetal deaths plus live births. 4. Number of fetal and infant deaths in perinatal period (from 28 weeks gestation (inclusive) to 6 days (inclusive) after birth per 1,000 fetal deaths plus live births. 5. Number of infant deaths (under one year of age) per 1,000 live births. 6. Number of deaths to infants less than 28 days of age per 1,000 live births. 7. Number of deaths to infants 28-364 days of age per 1,000 live births. 8. See Definition of Rates section in Appendix. 9. Less than 2,500 grams, or 5.5 pounds. 10. Less than 1,500 grams, or 3.3 pounds. 11. Born before completion of 37<sup>th</sup> week of gestation. 12. Based on Adequacy of Prenatal Care Utilization Index (see Glossary). 13. Facilities for high-risk deliveries and neonates that can provide care to very small infants, including mechanical ventilation and neonatal surgery and special care for transferred patients and for which a full-time neonatologist serves as the director. 14. "Low-risk"= full term birth, singleton, vertex presentation. 15. HP2010 specifies objective as mother breastfeeding in "early postpartum period." Massachusetts data is based on mother's self-report of current breastfeeding or intention to breastfeed.



# Appendix

**Table 15. Resident Birth Characteristics, Community Health Network Areas (CHNAs), Massachusetts: 2005**

| CHNA   | Population       | Crude Birth Rate <sup>1</sup> | Mother's Race and Ethnicity          |                                      |                            |   | Very Low Birthweight (<1500 g)<br>% | Low Birthweight (<2500 g)<br>% |
|--|------------------|-------------------------------|--------------------------------------|--------------------------------------|----------------------------|---|-------------------------------------|--------------------------------|
|  |                  |                               | White non-Hispanic<br>% <sup>3</sup> | Black non-Hispanic<br>% <sup>3</sup> | Hispanic<br>% <sup>3</sup> | Asian or Other <sup>2</sup><br>% <sup>3</sup> |                                     |                                |
| <b>STATE TOTAL</b>   | <b>6,436,940</b> | <b>11.9</b>                   | <b>69.6</b>                          | <b>7.9</b>                           | <b>13.1</b>                | <b>9.3</b>                                    | <b>1.4</b>                          | <b>7.9</b>                     |
| Community Health Network of Berkshire County                   | 131,965          | 9.7                           | 87.9                                 | 3.7                                  | 4.7                        | 3.4   | 1.3                                 | 8.6                            |
| Upper Valley Health Web (Franklin County)                      | 88,506           | 9.5                           | 89.8                                 | 1.9                                  | 3.3                        | 3.3   | 1.7                                 | 6.7                            |
| Partnership for Health in Hampshire County (Northampton)       | 151,801          | 7.7                           | 85.1                                 | 2.0                                  | 6.7                        | 6.2   | 1.0                                 | 8.0                            |
| The Community Health Connection (Springfield)                  | 299,490          | 12.5                          | 50.7                                 | 13.3                                 | 31.2                       | 4.6   | 1.7                                 | 8.9                            |
| Community Health Network of Southern Worcester County          | 119,141          | 11.9                          | 88.8                                 | 1.3                                  | 7.6                        | 2.3   | 1.6                                 | 7.7                            |
| Community Partners for Health (Milford)                        | 160,521          | 13.1                          | 90.0                                 | 1.0                                  | 3.4                        | 5.4   | 1.7                                 | 7.2                            |
| Community Health Network of Greater Metro West (Framingham)    | 379,658          | 13.0                          | 81.0                                 | 2.2                                  | 6.8                        | 9.9   | 1.3                                 | 7.0                            |
| Community Wellness Coalition (Worcester)                       | 303,669          | 13.2                          | 68.2                                 | 8.5                                  | 14.1                       | 9.1   | 1.7                                 | 7.7                            |
| Fitchburg/Gardner Community Health Network                     | 261,369          | 11.5                          | 80.7                                 | 3.0                                  | 11.3                       | 5.0   | 1.3                                 | 7.5                            |
| Greater Lowell Community Health Network                        | 272,893          | 13.2                          | 66.3                                 | 4.2                                  | 10.1                       | 19.3  | 1.1                                 | 8.3                            |
| Greater Lawrence Community Health Network                      | 195,176          | 14.0                          | 45.3                                 | 2.2                                  | 47.6                       | 4.9   | 1.8                                 | 7.9                            |
| Greater Haverhill Community Health Network                     | 148,557          | 11.9                          | 86.1                                 | 1.5                                  | 9.1                        | 3.3   | 1.1                                 | 7.7                            |
| Community Health Network North (Beverly/Gloucester)            | 119,378          | 10.0                          | 92.3                                 | 1.2                                  | 2.8                        | 3.7   | 1.0                                 | 6.8                            |
| North Shore Community Health Network                           | 287,352          | 11.9                          | 63.3                                 | 7.3                                  | 22.1                       | 7.2   | 1.1                                 | 7.6                            |
| Greater Woburn/Concord/Littleton Community Health Network      | 209,597          | 10.0                          | 78.4                                 | 2.6                                  | 3.1                        | 15.8  | 1.1                                 | 6.9                            |
| North Suburban Health Alliance (Medford/Malden/Melrose)        | 257,235          | 12.6                          | 69.7                                 | 9.6                                  | 9.0                        | 11.6  | 1.7                                 | 7.0                            |
| Greater Cambridge/Somerville Community Health Network          | 273,883          | 11.5                          | 67.5                                 | 8.4                                  | 8.8                        | 15.2  | 1.0                                 | 7.2                            |
| West Suburban Health Network (Newton/Waltham)                  | 253,138          | 10.2                          | 75.6                                 | 3.3                                  | 8.1                        | 12.9  | 0.8                                 | 6.4                            |
| Alliance for Community Health (Boston/Chelsea/Revere/Winthrop) | 711,603          | 13.6                          | 38.4                                 | 23.6                                 | 23.8                       | 14.0  | 2.0                                 | 9.4                            |
| Blue Hills Community Health Alliance (Greater Quincy)          | 372,309          | 11.7                          | 74.5                                 | 7.2                                  | 2.9                        | 15.2  | 1.4                                 | 7.6                            |
| Four (For) Communities (Holyoke, Chicopee, Ludlow, Westfield)  | 161,454          | 11.7                          | 65.7                                 | 2.1                                  | 29.6                       | 2.6   | 1.0                                 | 7.4                            |
| Greater Brockton Community Health Network                      | 242,404          | 12.8                          | 61.4                                 | 21.5                                 | 7.2                        | 9.8   | 1.8                                 | 10.3                           |
| South Shore Community Partners in Prevention (Plymouth)        | 188,787          | 11.3                          | 94.3                                 | 1.2                                  | 1.4                        | 2.8   | 1.0                                 | 7.8                            |
| Greater Attleboro-Taunton Health & Education Response          | 252,919          | 12.6                          | 87.3                                 | 3.0                                  | 3.5                        | 6.0   | 1.3                                 | 7.9                            |
| Partners for a Healthier Community (Fall River)                | 141,977          | 11.2                          | 84.5                                 | 5.7                                  | 5.9                        | 3.9   | 1.5                                 | 6.9                            |
| Greater New Bedford Health & Human Services Coalition          | 199,955          | 11.8                          | 76.2                                 | 4.3                                  | 13.1                       | 6.4   | 1.6                                 | 9.6                            |
| Cape and Islands Community Health Network                      | 252,204          | 9.2                           | 85.9                                 | 4.0                                  | 4.4                        | 5.5   | 0.9                                 | 6.4                            |

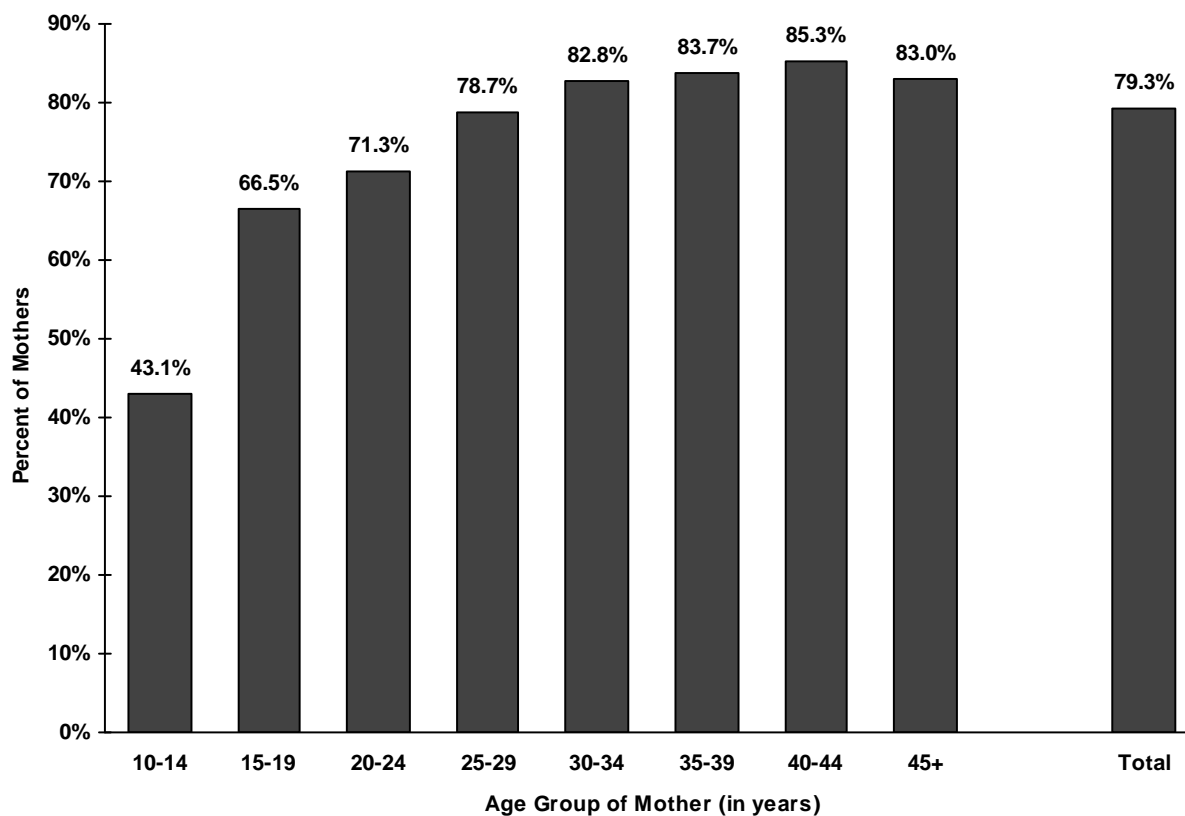
**Table 15 (cont'd) Resident Birth Characteristics, Community Health Network Areas (CHNAs), Massachusetts: 2005**

| CHNA Number and CHNA   | Births                              |   |             |                             |                   | Deaths                             |            |                                      |            |
|--|-------------------------------------|---|-------------|-----------------------------|-------------------|------------------------------------|------------|--------------------------------------|------------|
|  | Adequate Prenatal Care <sup>6</sup> | Public Payment <sup>7</sup> for Prenatal Care | Unmarried   | Teen Mothers 15 to 19 years |                   | Infant Mortality Rate <sup>8</sup> |            | Neonatal Mortality Rate <sup>8</sup> |            |
|  | %                                   | %   | %           | n                           | Rate <sup>4</sup> | 2005                               | 2003-2005  | 2005                                 | 2003-2005  |
| <b>STATE TOTAL</b>   | <b>84.0</b>                         | <b>32.6</b>                                   | <b>30.2</b> | <b>4,539</b>                | <b>21.7</b>       | <b>5.1</b>                         | <b>4.9</b> | <b>3.7</b>                           | <b>3.6</b> |
| 1. Community Health Network of Berkshire County                    | 72.5                                | 45.7  | 40.5        | 130                         | 29.0              | -- <sup>5</sup>                    | 5.2        | -- <sup>5</sup>                      | 3.4        |
| 2. Upper Valley Health Web (Franklin County)                       | 85.5                                | 35.9  | 34.6        | 58                          | 20.5              | -- <sup>5</sup>                    | 5.1        | -- <sup>5</sup>                      | 4.3        |
| 3. Partnership for Health in Hampshire County (Northampton)        | 86.9                                | 25.8  | 26.8        | 59                          | 7.0               | 4.3                                | 2.4        | -- <sup>5</sup>                      | 1.6        |
| 4. The Community Health Connection (Springfield)                   | 76.9                                | 54.4  | 50.9        | 493                         | 47.2              | 8.5                                | 6.8        | 6.7                                  | 4.7        |
| 5. Community Health Network of Southern Worcester County           | 87.4                                | 26.8  | 30.5        | 109                         | 28.0              | 5.7                                | 7.1        | 4.9                                  | 5.4        |
| 6. Community Partners for Health (Milford)                         | 88.7                                | 16.1  | 16.3        | 57                          | 11.3              | 4.3                                | 3.6        | 3.8                                  | 2.8        |
| 7. Community Health Network of Greater Metro West (Framingham)     | 86.9                                | 16.9  | 14.0        | 113                         | 10.7              | 4.3                                | 4.2        | 3.0                                  | 3.5        |
| 8. Community Wellness Coalition (Worcester)                        | 84.5                                | 33.5  | 34.0        | 294                         | 27.3              | 9.5                                | 6.4        | 8.0                                  | 5.2        |
| 9. Fitchburg/Gardner Community Health Network                      | 83.4                                | 28.8  | 29.6        | 184                         | 21.0              | 5.7                                | 4.7        | 3.7                                  | 3.2        |
| 10. Greater Lowell Community Health Network                        | 76.8                                | 32.0  | 31.9        | 252                         | 28.1              | 5.3                                | 5.2        | 2.8                                  | 3.1        |
| 11. Greater Lawrence Community Health Network                      | 78.4                                | 44.8  | 42.7        | 260                         | 39.2              | 6.2                                | 5.6        | 4.8                                  | 3.9        |
| 12. Greater Haverhill Community Health Network                     | 89.5                                | 21.6  | 23.9        | 97                          | 21.3              | 4.5                                | 3.8        | 3.4                                  | 2.9        |
| 13. Community Health Network North (Beverly/Gloucester)            | 92.0                                | 19.1  | 15.5        | 26                          | 6.6               | 0.0                                | 3.3        | -- <sup>5</sup>                      | 3.0        |
| 14. North Shore Community Health Network                           | 79.2                                | 41.0  | 34.0        | 201                         | 23.0              | 3.2                                | 4.9        | 2.6                                  | 3.7        |
| 15. Greater Woburn/Concord/Littleton Community Health Network      | 87.5                                | 9.6   | 10.0        | 39                          | 7.0               | 3.8                                | 2.6        | 2.9                                  | 2.0        |
| 16. North Suburban Health Alliance (Medford/Malden/Melrose)        | 86.2                                | 30.6  | 22.1        | 81                          | 11.4              | 5.3                                | 4.3        | 4.6                                  | 3.6        |
| 17. Greater Cambridge/Somerville Community Health Network          | 88.6                                | 21.4  | 17.7        | 64                          | 7.8               | 2.9                                | 3.8        | 2.2                                  | 3.1        |
| 18. West Suburban Health Network (Newton/Waltham)                  | 86.8                                | 11.7  | 9.8         | 35                          | 3.4               | -- <sup>5</sup>                    | 2.7        | -- <sup>5</sup>                      | 2.2        |
| 19. Alliance for Community Health (Boston/Chelsea/Revere/Winthrop) | 84.3                                | 46.4  | 42.4        | 695                         | 29.4              | 5.8                                | 5.7        | 4.6                                  | 4.5        |
| 20. Blue Hills Community Health Alliance (Greater Quincy)          | 87.8                                | 21.3  | 19.7        | 122                         | 11.8              | 5.5                                | 5.4        | 3.7                                  | 4.5        |
| 21. Four (For) Communities (Holyoke, Chicopee, Ludlow, Westfield)  | 81.9                                | 53.4  | 48.5        | 250                         | 43.8              | 3.7                                | 5.7        | -- <sup>5</sup>                      | 3.5        |
| 22. Greater Brockton Community Health Network                      | 80.1                                | 39.0  | 36.1        | 187                         | 21.2              | 4.5                                | 5.8        | 3.2                                  | 4.3        |
| 23. South Shore Community Partners in Prevention (Plymouth)        | 90.0                                | 14.8  | 17.1        | 76                          | 12.9              | 5.6                                | 4.7        | 3.8                                  | 3.4        |
| 24. Greater Attleboro-Taunton Health & Education Response          | 80.8                                | 26.2  | 24.4        | 149                         | 19.2              | 3.8                                | 3.0        | 2.5                                  | 2.4        |
| 25. Partners for a Healthier Community (Fall River)                | 87.3                                | 54.9  | 44.2        | 160                         | 36.9              | 6.9                                | 5.8        | 3.1                                  | 3.5        |
| 26. Greater New Bedford Health & Human Services Coalition          | 80.3                                | 46.2  | 47.8        | 226                         | 34.7              | 6.8                                | 5.4        | 3.8                                  | 3.4        |
| 27. Cape and Islands Community Health Network                      | 86.8                                | 33.5  | 28.3        | 122                         | 18.6              | 3.9                                | 4.7        | -- <sup>5</sup>                      | 2.8        |

NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.

1. Births per 1,000 residents (male and female). 2005 rates are calculated using Massachusetts (Department of Public Health) Modified Age, Race/Ethnicity, & Sex Estimates 2005 (MMARS05), released October, 2006. (see Technical Notes in Appendix). 2. Mothers who designated themselves as Asian, American Indian or Other. 3. For the category of Mother's Race and Ethnicity, percentages are calculated based on the state total of resident births, including births for which mother's race/Hispanic ethnicity is unknown. 4. Births per 1,000 female residents ages 15-19. 5. Calculations based on fewer than 5 events are excluded. 6. Based on the Adequacy of Prenatal Care Utilization (APNCU) Index. Please see Glossary for definition. 7. Public payment sources include Commonhealth, Healthy Start, Medicaid/MassHealth, and Medicare (may be HMO or managed care), or free care. 8. Deaths per 1,000 live births. See Definitions of Rates section in Appendix for definitions of infant and neonatal mortality rates.

**Figure 9. Percent of Mothers Breastfeeding or Intending to Breastfeed<sup>1</sup>  
by Age Group, Massachusetts: 2005**

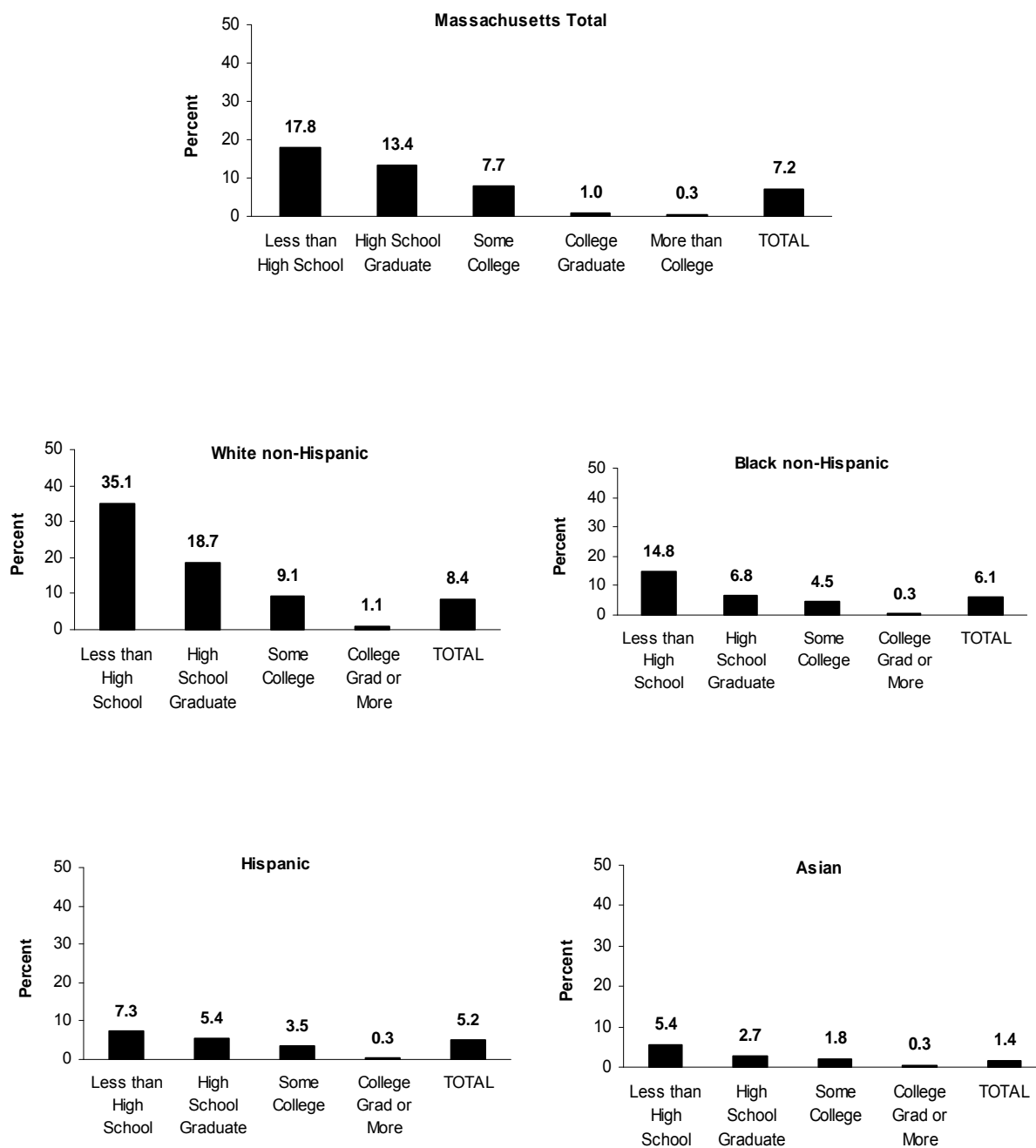


NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.

1. Information about breastfeeding is reported by the mother at the time of the birth.

2. For race-specific breastfeeding rates see Table 2.

**Figure 10. Percent of Mothers who Smoked During Pregnancy<sup>1</sup>, by Mother's Race/Hispanic Ethnicity and Educational Attainment, Massachusetts: 2005**



NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.

1. Based on information provided on parent worksheet. Because smoking is self-reported, data on smoking prevalence should be interpreted cautiously. Mothers with multiples are counted for each birth. Caution should be used with Asian data because of small numbers.

**Figure 11. Distribution of Smoking Status<sup>1</sup> during Pregnancy  
by Smoking Status Prior to Pregnancy, Massachusetts: 2005**

**Smoking  
Status<sup>1</sup>  
Prior to  
Pregnancy:**

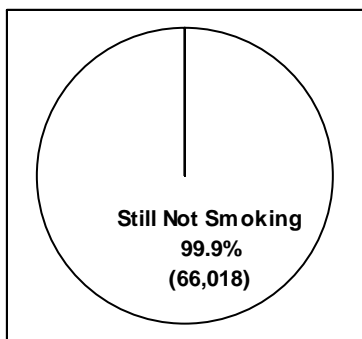
**Non-Smokers**  
86.2%  
(66,069)

**Light Smokers**  
7.8%  
(5,981)

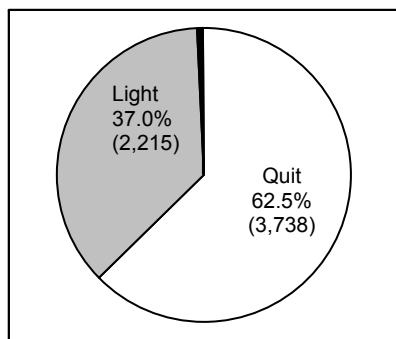
**Moderate Smokers**  
5.3%  
(4,069)

**Heavy Smokers**  
0.7%  
(523)

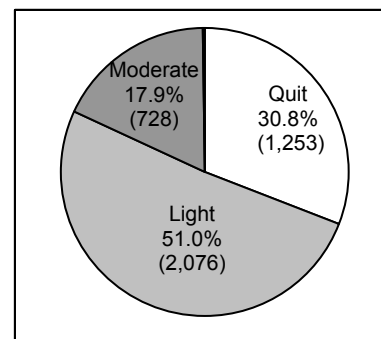
**Smoking  
Status<sup>1</sup>  
During  
Pregnancy:**



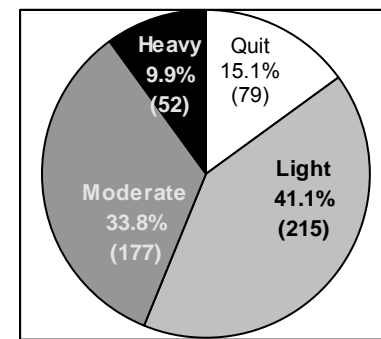
**99.9% of Non-Smokers  
continued not smoking  
(0.1% started smoking)**



**62.5 % of Light Smokers quit  
smoking (0.5% increased)**



**81.8% of Moderate Smokers  
decreased the number of  
cigarettes smoked daily or  
quit (0.3% increased)**



**90.1% of Heavy Smokers  
decreased the number of  
cigarettes smoked daily  
or quit**

NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.

1. Light Smokers=1-10 cigarettes daily; Moderate Smokers=11-20 cigarettes daily; Heavy Smokers=21 cigarettes or more daily.



**Table 16. Parity<sup>1</sup> by Age of Mother, Massachusetts: 2005**

| <b>Age of Mother (years)</b> |                | <b>Total Births</b> | <b>1st</b> | <b>2nd</b>      | <b>3rd</b>      | <b>4th</b>      | <b>5th+</b>     |
|------------------------------|----------------|---------------------|------------|-----------------|-----------------|-----------------|-----------------|
| STATE TOTAL                  | n <sup>2</sup> | 76,824              | 33,891     | 26,558          | 10,810          | 3,546           | 1,802           |
|                              | % <sup>3</sup> | 100.0               | 44.2       | 34.7            | 14.1            | 4.6             | 2.4             |
| <b>10-14</b>                 | n              | 59                  | 57         | 1               | 0               | 0               | 0               |
|                              | %              | 100.0               | 98.3       | -- <sup>4</sup> | -- <sup>4</sup> | -- <sup>4</sup> | -- <sup>4</sup> |
| <b>15-19</b>                 | n              | 4,539               | 3,861      | 599             | 58              | 7               | 1               |
|                              | %              | 100.0               | 85.3       | 13.2            | 1.3             | 0.2             | -- <sup>4</sup> |
| <b>20-24</b>                 | n              | 11,805              | 6,671      | 3,692           | 1,108           | 242             | 61              |
|                              | %              | 100.0               | 56.7       | 31.4            | 9.4             | 2.1             | 0.5             |
| <b>25-29</b>                 | n              | 18,026              | 8,748      | 5,799           | 2,324           | 791             | 313             |
|                              | %              | 100.0               | 48.7       | 32.3            | 12.9            | 4.4             | 1.7             |
| <b>30-34</b>                 | n              | 24,140              | 9,433      | 9,461           | 3,529           | 1,099           | 561             |
|                              | %              | 100.0               | 39.2       | 39.3            | 14.7            | 4.6             | 2.3             |
| <b>35-39</b>                 | n              | 14,740              | 4,162      | 5,719           | 3,121           | 1,100           | 587             |
|                              | %              | 100.0               | 28.3       | 38.9            | 21.2            | 7.5             | 4.0             |
| <b>40-44</b>                 | n              | 3,323               | 900        | 1,233           | 645             | 286             | 246             |
|                              | %              | 100.0               | 27.2       | 37.3            | 19.5            | 8.6             | 7.4             |
| <b>45+</b>                   | n              | 188                 | 58         | 52              | 24              | 21              | 33              |
|                              | %              | 100.0               | 30.9       | 27.7            | 12.8            | 11.2            | 17.6            |

NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.

1. The number of live births including this birth. 2. State totals include births of unknown parity and unknown mother's age. 3. Percents may not sum to 100.0 due to rounding. 4. Calculations based on fewer than five events are excluded.

**Table 17. Selected Birth Characteristics by Maternal Education, Massachusetts: 2005**

|   | <u>Less than High School</u> |                | <u>High School Graduate</u> |                | <u>Some College</u> |                | <u>College Graduate</u> |                | <u>More than College</u> |                |
|---|------------------------------|----------------|-----------------------------|----------------|---------------------|----------------|-------------------------|----------------|--------------------------|----------------|
|   | n                            | % <sup>1</sup> | n                           | % <sup>1</sup> | n                   | % <sup>1</sup> | n                       | % <sup>1</sup> | n                        | % <sup>1</sup> |
| <b>State Total</b>                        | 7,949                        | 10.4           | 19,312                      | 25.2           | 16,968              | 22.1           | 20,650                  | 26.9           | 11,762                   | 15.3           |
| <b>Race</b>                               |                              |                |                             |                |                     |                |                         |                |                          |                |
| White non-Hispanic                        | 2,802                        | 5.2            | 11,569                      | 21.7           | 12,226              | 22.9           | 17,093                  | 32.0           | 9,696                    | 18.2           |
| Black non-Hispanic                        | 830                          | 13.7           | 2,314                       | 38.1           | 1,813               | 29.9           | 867                     | 14.3           | 244                      | 4.0            |
| Hispanic                                  | 3,409                        | 33.9           | 3,838                       | 38.2           | 1,805               | 17.9           | 716                     | 7.1            | 289                      | 2.9            |
| Asian                                     | 575                          | 11.0           | 891                         | 17.0           | 712                 | 13.6           | 1,681                   | 32.1           | 1,385                    | 26.4           |
| <b>Age</b>                                |                              |                |                             |                |                     |                |                         |                |                          |                |
| 20-29                                     | 3,997                        | 13.4           | 10,708                      | 36.0           | 7,927               | 26.6           | 5,318                   | 17.9           | 1,816                    | 6.1            |
| 30-39                                     | 1,452                        | 3.7            | 6,122                       | 15.8           | 7,992               | 20.6           | 14,116                  | 36.4           | 9,103                    | 23.5           |
| 40+                                       | 151                          | 4.3            | 564                         | 16.1           | 751                 | 21.5           | 1,192                   | 34.1           | 842                      | 24.1           |
| <b>Non-U.S.-born<sup>2</sup></b>          | 3,347                        | 42.1           | 6,094                       | 31.6           | 3,685               | 21.7           | 4,209                   | 20.4           | 2,671                    | 22.7           |
| <b>Unmarried</b>                          | 5,851                        | 73.6           | 10,170                      | 52.7           | 5,295               | 31.2           | 1,423                   | 6.9            | 378                      | 3.2            |
| <b>Publicly-financed prenatal care</b>    | 6,541                        | 83.8           | 11,136                      | 58.6           | 5,030               | 31.0           | 1,469                   | 7.2            | 288                      | 2.5            |
| <b>Very low birthweight<sup>3</sup></b>   | 117                          | 1.5            | 335                         | 1.7            | 242                 | 1.4            | 298                     | 1.4            | 94                       | 0.8            |
| <b>Low birthweight<sup>4</sup></b>        | 711                          | 9.0            | 1,698                       | 8.8            | 1,336               | 7.9            | 1,532                   | 7.4            | 777                      | 6.6            |
| <b>Adequate prenatal care<sup>5</sup></b> | 5,392                        | 69.4           | 15,270                      | 80.1           | 14,180              | 84.9           | 18,310                  | 89.2           | 10,513                   | 89.8           |
| <b>Cesarean section delivery</b>          | 1,875                        | 23.7           | 5,829                       | 30.3           | 5,708               | 33.8           | 7,292                   | 35.4           | 3,968                    | 33.8           |
| <b>Breastfeeding<sup>6</sup></b>          | 5,120                        | 65.1           | 13,567                      | 71.1           | 12,339              | 75.9           | 18,014                  | 88.0           | 10,732                   | 92.0           |
| <b>Multiple births</b>                    | 156                          | 2.0            | 619                         | 3.2            | 775                 | 4.6            | 1,280                   | 6.2            | 728                      | 6.2            |
| <b>Smoking during pregnancy</b>           | 1,417                        | 17.8           | 2,592                       | 13.4           | 1,306               | 7.7            | 201                     | 1.0            | 35                       | 0.3            |

NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.

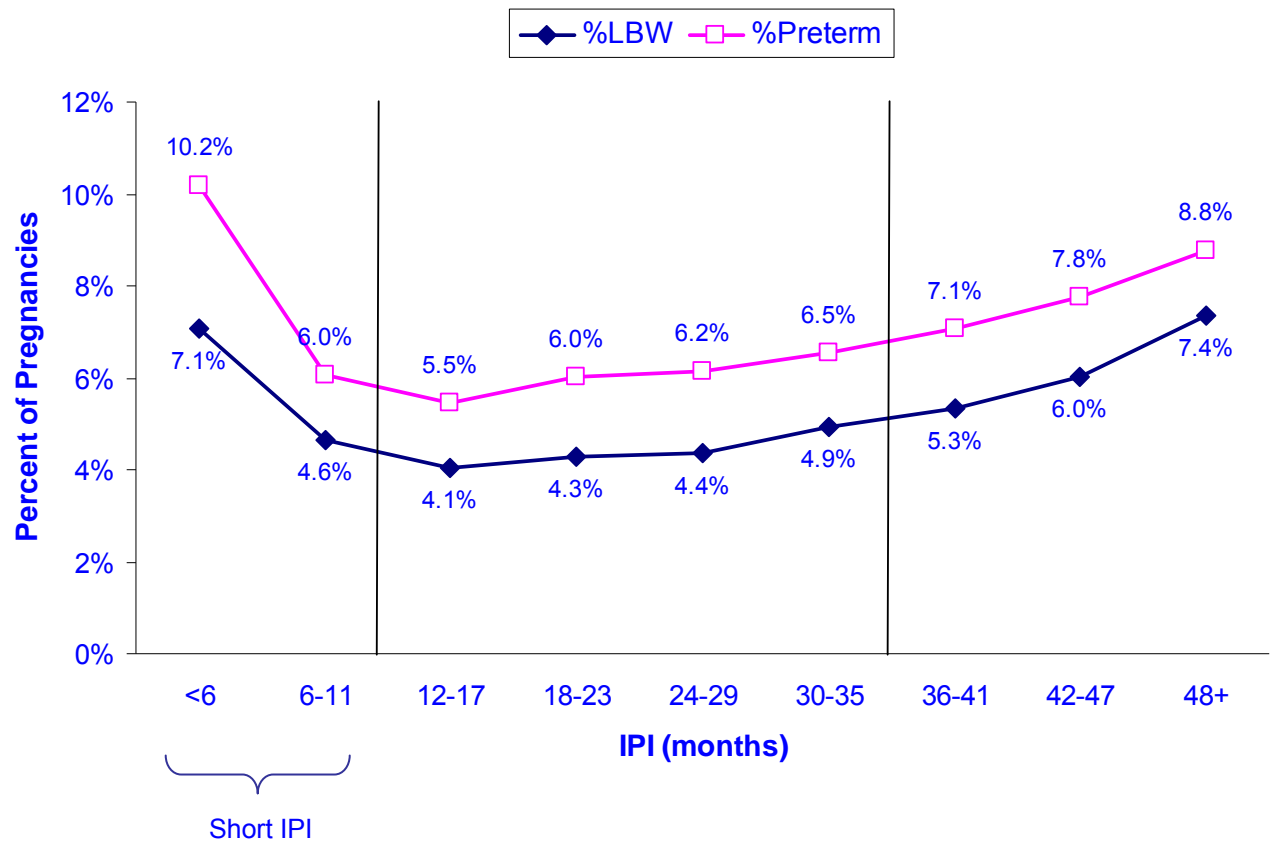
1. For state total, race and age categories, percentages are based on row totals. For all other categories, percentages are based on state column totals. 2. Includes women born outside of the 50 U.S. States, Washington D.C., and Puerto Rico/U.S. territories (the U.S. Virgin Islands, and Guam). 3. Very low birthweight: less than 1,500 grams or 3.3 pounds. 4. Low birthweight: less than 2,500 grams or 5.5 pounds. 5. Beginning with the 2001 publication, the Adequacy of Prenatal Care Utilization Index has replaced the Kessner Index as the measure of adequate prenatal care. 6. Mother was breastfeeding or was intending to breastfeed at the time the birth certificate was completed.

**Table 18. Inter-pregnancy Interval<sup>1</sup> (IPI) and Birth Outcomes. Pregnancies to Multiparous<sup>2</sup> Mothers, Massachusetts: 2005**

| IPI<br>(months) Pregnancies |               | Birth Weight (BW) |             |                     |             | Gestational Age (GA)          |             |                                  |                 |
|-----------------------------|---------------|-------------------|-------------|---------------------|-------------|-------------------------------|-------------|----------------------------------|-----------------|
|                             |               | Low ( <2,500 g)   |             | Very Low (<1,500 g) |             | Preterm <sup>3</sup> (<37 wk) |             | Very Early <sup>4</sup> (<28 wk) |                 |
|                             |               | n                 | %LBW        | n                   | %VLBW       | n                             | %Preterm    | n                                | %VEGA           |
| <b>State Total</b>          | <b>40,605</b> | <b>2,209</b>      | <b>5.4%</b> | <b>349</b>          | <b>0.9%</b> | <b>2,860</b>                  | <b>7.1%</b> | <b>157</b>                       | <b>0.4%</b>     |
| <b>&lt;6</b>                | 1,796         | 127               | 7.1%        | 29                  | 1.6%        | 182                           | 10.2%       | 14                               | 0.8%            |
| <b>6-11</b>                 | 4,679         | 217               | 4.6%        | 28                  | 0.6%        | 282                           | 6.0%        | 17                               | 0.4%            |
| <b>12-17</b>                | 6,138         | 249               | 4.1%        | 34                  | 0.6%        | 335                           | 5.5%        | 16                               | 0.3%            |
| <b>18-23</b>                | 5,261         | 226               | 4.3%        | 35                  | 0.7%        | 316                           | 6.0%        | 13                               | 0.2%            |
| <b>24-29</b>                | 4,234         | 185               | 4.4%        | 30                  | 0.7%        | 260                           | 6.2%        | 14                               | 0.3%            |
| <b>30-35</b>                | 3,154         | 155               | 4.9%        | 28                  | 0.9%        | 206                           | 6.5%        | 12                               | 0.4%            |
| <b>36-41</b>                | 2,484         | 132               | 5.3%        | 12                  | 0.5%        | 175                           | 7.1%        | 4                                | -- <sup>5</sup> |
| <b>42-47</b>                | 2,049         | 123               | 6.0%        | 11                  | 0.5%        | 159                           | 7.8%        | 4                                | -- <sup>5</sup> |
| <b>48+</b>                  | 10,810        | 795               | 7.4%        | 142                 | 1.3%        | 945                           | 8.8%        | 63                               | 0.6%            |
| <b>Short 0-11</b>           | 6,475         | 344               | 5.3%        | 57                  | 0.7%        | 464                           | 25.9%       | 31                               | 1.7%            |
| <b>12-35</b>                | 18,787        | 815               | 4.3%        | 127                 | 0.6%        | 1,117                         | 62.4%       | 55                               | 3.1%            |
| <b>36+</b>                  | 15,343        | 1,050             | 6.8%        | 165                 | 1.2%        | 1,279                         | 71.4%       | 71                               | 4.0%            |

1. Inter-pregnancy Interval (IPI) is the time in months between the date of last menstrual period of current pregnancy and the date of previous live birth. 2. Multiparous is defined as having given birth 2 or more times. 3. Also known as premature delivery. 4. Very early gestational age (VEGA) refers to birth delivery before 28 weeks of gestational age and is also known as **extremely preterm** delivery. 5. Calculations based on fewer than 5 are excluded.

**Figure 12. Inter-pregnancy Interval (IPI)<sup>1</sup> vs. LBW<sup>2</sup> and Preterm<sup>3</sup>-- Pregnancies to Multiparous Mothers<sup>4</sup>, Massachusetts: 2005**



**NOTE:** Short IPIs (less than 12 months) and IPIs over 35 months were associated with higher proportions on low birthweight and premature deliveries.

Percentages are calculated based on pregnancies to mothers who gave birth to their 2<sup>nd</sup> or later child in 2005 and with known values for the characteristic(s) of interest, unless otherwise stated.

1. Inter-pregnancy Interval (IPI) is the time in months between the date of last menstrual period of current pregnancy and the date of previous live birth. 2. Low birthweight: less than 2,500 grams or 5.5 pounds. 3. Preterm delivery is defined as gestational age less than 37 weeks. It is also known as premature delivery. 4. Multiparous is defined as having given birth 2 or more times.

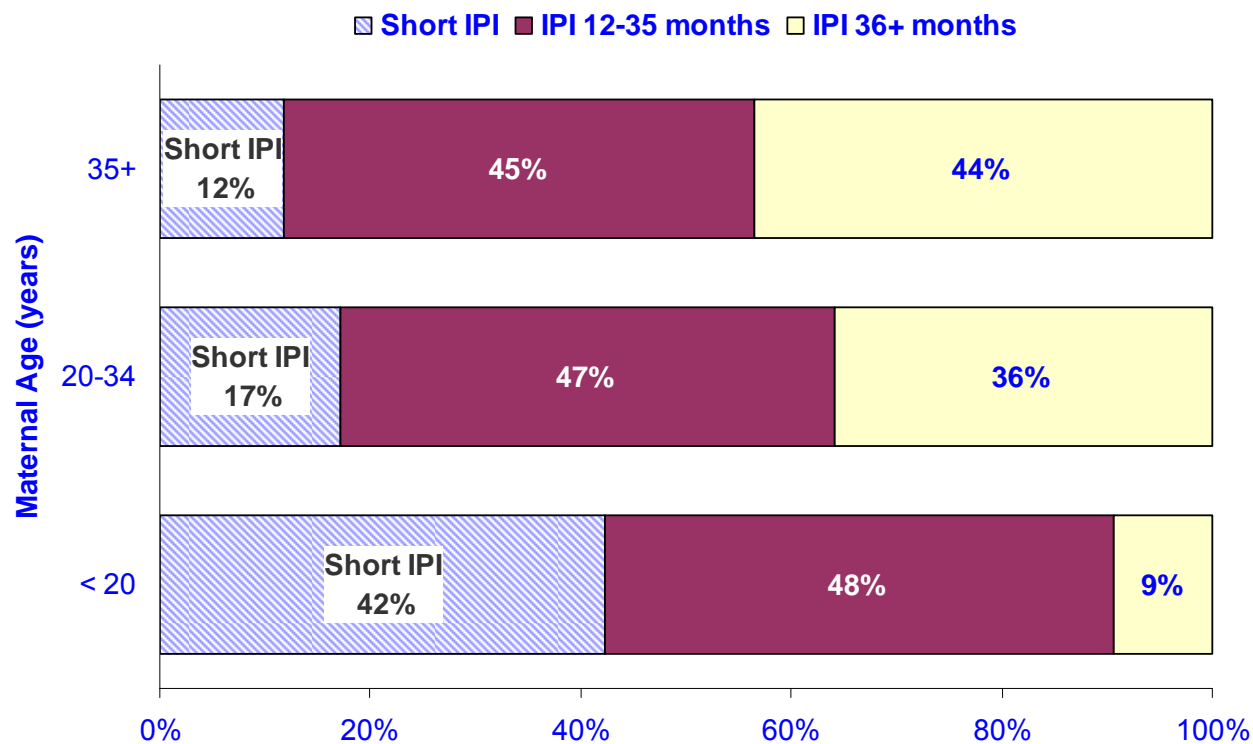
**Table 19. Inter-pregnancy Interval<sup>1</sup> (IPI) by Maternal Characteristics --Pregnancies to Multiparous Mothers<sup>2</sup>, Massachusetts: 2005**

|                                      | Total<br>Pregnancies<br>Parity >1 |             | IPI                           |              |                               |              |                               |              |
|--------------------------------------|-----------------------------------|-------------|-------------------------------|--------------|-------------------------------|--------------|-------------------------------|--------------|
|                                      |                                   |             | Short<br>< 12 months          |              | 12-35 months                  |              | 36+ months                    |              |
|                                      | n                                 | %           | n                             | %            | n                             | %            | n                             | %            |
| <b>State Total<sup>3</sup></b>       | <b>40,604</b>                     | <b>100%</b> | <b>6,475</b>                  | <b>15.9%</b> | <b>18,787</b>                 | <b>46.3%</b> | <b>15,342</b>                 | <b>37.8%</b> |
| <b>Age</b>                           |                                   |             |                               |              |                               |              |                               |              |
| < 20                                 | 624                               | 1.5         | 264                           | 42.3         | 302                           | 48.4         | 58                            | 9.3          |
| 20-34                                | 27,691                            | 68.2        | 4,754                         | 17.2         | 13,000                        | 46.9         | 9,937                         | 35.9         |
| 35+                                  | 12,289                            | 30.3        | 1,457                         | 11.9         | 5,485                         | 44.6         | 5,347                         | 43.5         |
| <b>Race Ethnicity</b>                |                                   |             |                               |              |                               |              |                               |              |
| White non-Hispanic                   | 28,087                            | 69.2        | 4,692                         | 16.7         | 14,258                        | 50.8         | 9,138                         | 32.5         |
| Black non-Hispanic                   | 3,397                             | 8.4         | 477                           | 14.0         | 1,134                         | 33.4         | 1,786                         | 52.6         |
| Hispanics                            | 5,745                             | 14.1        | 847                           | 14.7         | 1,994                         | 34.7         | 2,904                         | 50.5         |
| Asian                                | 2,446                             | 6.0         | 336                           | 13.7         | 1,070                         | 43.7         | 1,040                         | 42.5         |
| <b>Education</b>                     |                                   |             |                               |              |                               |              |                               |              |
| High School or less                  | 14,726                            | 36.3        | 2,343                         | 15.9         | 5,264                         | 35.7         | 7,119                         | 48.3         |
| BA or Assoc                          | 20,105                            | 49.5        | 3,190                         | 15.9         | 9,984                         | 49.7         | 6,932                         | 34.5         |
| More than college                    | 5,720                             | 14.1        | 937                           | 16.4         | 3,514                         | 61.4         | 1,269                         | 22.2         |
| <b>Delivery Payment Source</b>       |                                   |             |                               |              |                               |              |                               |              |
| Public                               | 13,409                            | 33.0        | 2,171                         | 16.2         | 4,784                         | 35.7         | 6,454                         | 48.1         |
| Private                              | 26,100                            | 64.3        | 4,115                         | 15.8         | 13,486                        | 51.7         | 8,499                         | 32.6         |
| <b>EOHHS Region of Residence</b>     |                                   |             |                               |              |                               |              |                               |              |
| Western MA                           | 4,986                             | 12.3        | 871                           | 17.5         | 2,156                         | 43.2         | 1,959                         | 39.3         |
| Central MA                           | 5,519                             | 13.6        | 873                           | 15.8         | 2,669                         | 48.4         | 1,977                         | 35.8         |
| Northeast MA                         | 8,573                             | 21.1        | 1,361                         | 15.9         | 3,912                         | 45.6         | 3,300                         | 38.5         |
| Metrowest MA                         | 8,735                             | 21.5        | 1,340                         | 15.3         | 4,693                         | 53.7         | 2,702                         | 30.9         |
| Southeast MA                         | 8,140                             | 20.0        | 1,333                         | 16.4         | 3,597                         | 44.2         | 3,210                         | 39.4         |
| Boston Region                        | 4,652                             | 11.5        | 697                           | 15.0         | 1,760                         | 37.8         | 2,195                         | 47.2         |
| <b>Town of Residency<sup>4</sup></b> |                                   |             | <b><u>10 Largest by %</u></b> |              | <b><u>10 Largest by %</u></b> |              | <b><u>10 Largest by %</u></b> |              |
|                                      |                                   |             | Holyoke (21.0%)               |              | Arlington (60.2%)             |              | Worcester (42.7%)             |              |
|                                      |                                   |             | Haverhill (20.9%)             |              | Beverly (58.5%)               |              | Woburn (40.6%)                |              |
|                                      |                                   |             | Weymouth (20.5%)              |              | Franklin (58.3%)              |              | Weymouth (36.1%)              |              |
|                                      |                                   |             | Quincy (19.0%)                |              | Newton (56.4%)                |              | Westfield (36.9%)             |              |
|                                      |                                   |             | Attleboro (18.6%)             |              | Shrewsbury (53.6%)            |              | Waltham (38.6%)               |              |
|                                      |                                   |             | Medford (18.3%)               |              | Cambridge (52.7%)             |              | Taunton (44.2%)               |              |
|                                      |                                   |             | Pittsfield (18.1%)            |              | Brookline (52.5%)             |              | Springfield (45.1%)           |              |
|                                      |                                   |             | Chicopee (17.7%)              |              | North Attleboro (52.5%)       |              | Somerville (42.1%)            |              |
|                                      |                                   |             | North Attleboro (17.6%)       |              | Billerica (52.2%)             |              | Shrewsbury (33.0%)            |              |
|                                      |                                   |             | Lawrence (17.5%)              |              | Braintree (52.1%)             |              | Salem (40.2%)                 |              |

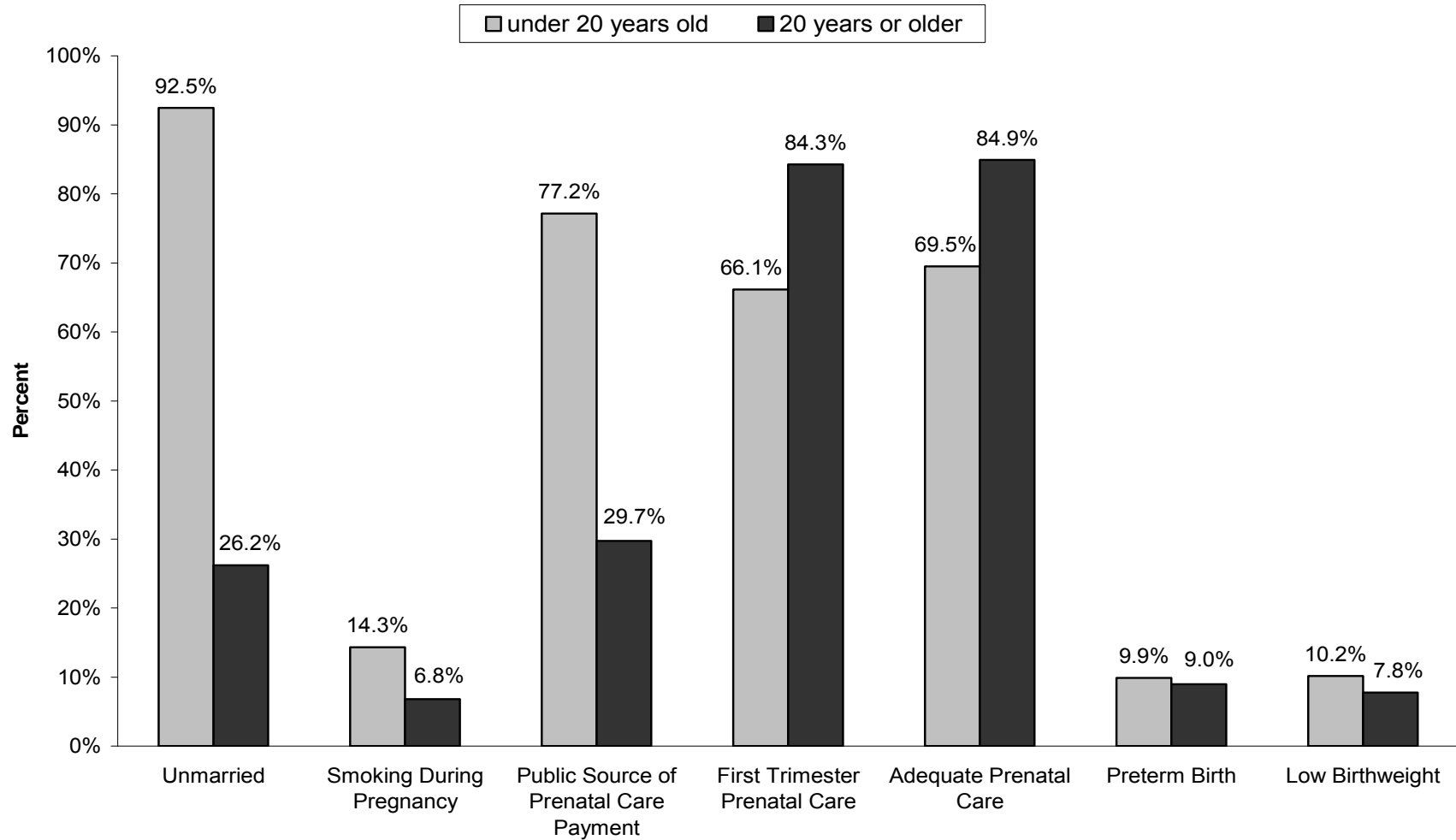
1. Inter-pregnancy Interval (IPI) is the time in months between the date of last menstrual period of current pregnancy and the date of previous live birth. 2. Multiparous is defined as having given birth 2 or more times. 3. State total includes pregnancies with known IPI.

4. Among towns with at least 200 mothers giving birth to their 2nd or later child.

**Figure 13. Inter-pregnancy Interval (IPI)<sup>1</sup> Distribution by Maternal Age -- Pregnancies to Multiparous Mothers<sup>2</sup>, Massachusetts: 2005**



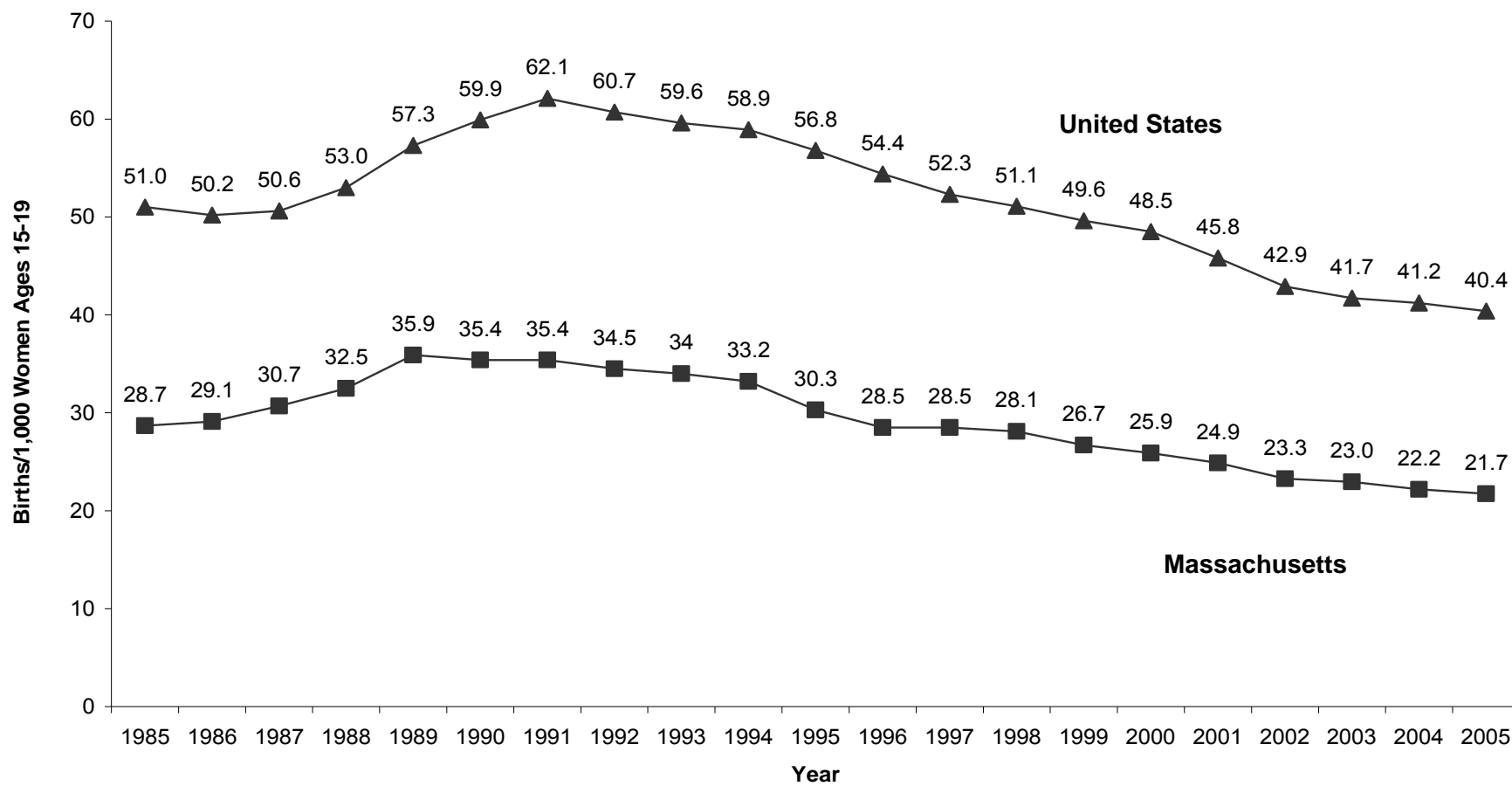
**Figure 14. Comparison of Teen vs. Adult Births, Selected Characteristics, Massachusetts: 2005**



NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated. Three age groups are used for "teen births": 10-14, 15-19, and <20. The "10-14" group, refers to young teens, and the "15-19" group is the age group referred to as teens by the Centers for Disease Control and Prevention. For this publication, "<20" is used when comparing young women with "adult" women.

Definitions: Unmarried = Includes those women who were unmarried 300 days before giving birth, Adequate Prenatal Care = based on Adequacy of Prenatal Care Utilization (APNCU) Index. See Appendix (Glossary and Technical Notes) for more details on the APNCU Index. Preterm Birth = gestational age less than 37 weeks, based on clinical estimate of gestational age. Low Birthweight = less than 2,500 grams (5.5 lbs.).

**Figure 15. Trend in Birth Rates Among Women Ages 15-19, Massachusetts and the United States: 1985-2005**



Teen birth rate is the number of births to women ages 15-19 per 1,000 women ages 15-19

Data sources: 1) U.S. annual natality data (NCHS) and 1990 U.S. Census data (population data used in denominators); 2) Massachusetts: annual birth data files, decennial Census counts (1990) and intercensal population estimates based on MISER (Massachusetts Institute for Social and Economic Research) population estimates for 1991 through 1998. 1999 rates are calculated using the 1999 DPH Massachusetts population estimates and Massachusetts (Department of Public Health) Modified Age, Race/Ethnicity, & Sex Estimates 2000-2005, released October, 2006 (see Technical Notes in Appendix). PLEASE NOTE: DIFFERENCES BETWEEN THESE RATES AND PREVIOUSLY PUBLISHED DATA REFLECT UPDATES IN POPULATION ESTIMATES.



**Table 20. Resident Teen Birth Characteristics, 30 Largest Municipalities<sup>1</sup>, Massachusetts: 2005**

| Municipality       | Total Population Rank | Female Population, age 15-19 | Number of Teen Births | Teen Birth Rate <sup>2</sup> | Mother's Race and Hispanic Ethnicity (% of teen births) |                    |                 |                             |
|--------------------|-----------------------|------------------------------|-----------------------|------------------------------|---|--------------------|-----------------|-----------------------------|
|                    |                       |                              |                       |                              | White non-Hispanic                                      | Black non-Hispanic | Hispanic        | Asian or other <sup>3</sup> |
| <b>State Total</b> |                       | <b>208,824</b>               | <b>4,539</b>          | <b>21.7</b>                  | <b>45.7</b>   | <b>13.0</b>        | <b>33.6</b>     | <b>7.7</b>                  |
| Attleboro          | 29                    | 1,134                        | 29                    | 25.6                         | 65.5  | 3.4                | 27.6            | 3.4                         |
| Barnstable         | 25                    | 1,360                        | 29                    | 21.3                         | 82.8  | 6.9                | 6.9             | 3.4                         |
| Boston             | 1                     | 19,770                       | 566                   | 28.6                         | 9.7   | 43.8               | 32.0            | 14.3                        |
| Brockton           | 6                     | 3,638                        | 148                   | 40.7                         | 33.1  | 29.1               | 12.8            | 25.0                        |
| Brookline          | 18                    | 1,451                        | -- <sup>5</sup>       | -- <sup>5</sup>              | -- <sup>5</sup>   | -- <sup>5</sup>    | -- <sup>5</sup> | -- <sup>5</sup>             |
| Cambridge          | 5                     | 3,923                        | 20                    | 5.1                          | 10.0  | 40.0               | 50.0            | 0.0                         |
| Chicopee           | 21                    | 1,738                        | 72                    | 41.4                         | 59.7  | 4.2                | 36.1            | 0.0                         |
| Fall River         | 9                     | 2,829                        | 140                   | 49.5                         | 68.6  | 10.0               | 12.9            | 8.6                         |
| Framingham         | 14                    | 1,955                        | 45                    | 23.0                         | 51.1  | 6.7                | 40.0            | 2.2                         |
| Haverhill          | 15                    | 1,908                        | 59                    | 30.9                         | 61.0  | 5.1                | 27.1            | 6.8                         |
| Lawrence           | 12                    | 3,027                        | 217                   | 71.7                         | 9.2   | 2.3                | 86.2            | 2.3                         |
| Leominster         | 30                    | 1,254                        | 22                    | 17.5                         | 54.6  | 4.5                | 36.4            | 4.5                         |
| Lowell             | 4                     | 3,966                        | 204                   | 51.4                         | 31.9  | 3.9                | 34.3            | 29.9                        |
| Lynn               | 8                     | 3,084                        | 146                   | 47.3                         | 21.2  | 13.7               | 50.0            | 15.1                        |
| Malden             | 17                    | 1,430                        | 23                    | 16.1                         | 56.5  | 4.3                | 26.1            | 13.0                        |
| Medford            | 22                    | 1,776                        | 13                    | 7.3                          | 61.5  | 15.4               | 15.4            | 7.7                         |
| Methuen            | 27                    | 1,327                        | 36                    | 27.1                         | 30.6  | 2.8                | 63.9            | 2.8                         |
| New Bedford        | 7                     | 2,955                        | 174                   | 58.9                         | 54.0  | 5.7                | 32.2            | 8.0                         |
| Newton             | 11                    | 3,500                        | -- <sup>5</sup>       | -- <sup>5</sup>              | -- <sup>5</sup>   | -- <sup>5</sup>    | -- <sup>5</sup> | -- <sup>5</sup>             |
| Peabody            | 24                    | 1,432                        | 15                    | 10.5                         | 80.0  | 0.0                | 6.7             | 13.3                        |
| Pittsfield         | 28                    | 1,270                        | 67                    | 52.7                         | 77.6  | 9.0                | 10.5            | 3.0                         |
| Plymouth           | 20                    | 1,672                        | 26                    | 15.6                         | 80.8  | 7.7                | 3.8             | 7.7                         |
| Quincy             | 10                    | 2,078                        | 48                    | 23.1                         | 60.4  | 12.5               | 8.3             | 16.7                        |
| Revere             | 26                    | 1,053                        | 48                    | 45.6                         | 41.7  | 2.1                | 43.8            | 12.5                        |
| Somerville         | 13                    | 2,170                        | 37                    | 17.1                         | 37.8  | 18.9               | 40.5            | 2.7                         |
| Springfield        | 3                     | 6,074                        | 435                   | 71.6                         | 12.2  | 19.1               | 65.8            | 2.8                         |
| Taunton            | 19                    | 1,631                        | 53                    | 32.5                         | 73.6  | 13.2               | 5.7             | 7.5                         |
| Waltham            | 16                    | 2,340                        | 22                    | 9.4                          | 36.4  | 4.5                | 50.0            | 9.1                         |
| Weymouth           | 23                    | 1,452                        | 22                    | 15.2                         | 90.9  | 0.0                | 0.0             | 9.1                         |
| Worcester          | 2                     | 7,036                        | 262                   | 37.2                         | 52.7  | 8.0                | 35.1            | 3.8                         |

Table 20 (cont.). Resident Teen Birth Characteristics, 30 Largest Municipalities, Massachusetts: 2005

| Municipality       | Public<br>Payment for<br>Prenatal<br>Care <sup>4</sup> (%) | Unmarried<br>(%) | Low<br>Birthweight <sup>6</sup><br>(%) | Preterm <sup>7</sup><br>(%) | Adequacy of Prenatal Care <sup>8</sup> |                   |              |             |
|--------------------|--|------------------|--|-----------------------------|--|-------------------|--------------|-------------|
|                    |  |                  |  |                             | Adequate<br>Intensive                  | Adequate<br>Basic | Intermediate | Inadequate  |
| <b>State Total</b> | <b>77.0</b>  | <b>92.4</b>      | <b>10.1</b>                            | <b>9.8</b>                  | <b>32.1</b>                            | <b>37.7</b>       | <b>10.4</b>  | <b>19.7</b> |
| Attleboro          | 56.0   | 93.1             | 6.9                                    | 13.8                        | 32.1                                   | 21.4              | 25.0         | 21.4        |
| Barnstable         | 65.5   | 82.8             | 3.5                                    | 0.0                         | 20.7                                   | 58.6              | 3.5          | 17.2        |
| Boston             | 77.7   | 96.3             | 12.2                                   | 11.9                        | 28.6                                   | 46.5              | 9.0          | 15.9        |
| Brockton           | 82.1   | 91.9             | 14.9                                   | 10.1                        | 26.7                                   | 37.0              | 11.6         | 24.7        |
| Brookline          | 50.0   | 100.0            | 0.0                                    | 0.0                         | 0.0                                    | 50.0              | 50.0         | 0.0         |
| Cambridge          | 70.0   | 100.0            | 15.0                                   | 10.0                        | 42.1                                   | 36.8              | 5.3          | 15.8        |
| Chicopee           | 86.1   | 88.9             | 6.9                                    | 7.0                         | 33.3                                   | 41.7              | 6.9          | 18.1        |
| Fall River         | 89.9   | 88.6             | 10.0                                   | 9.3                         | 58.3                                   | 15.1              | 2.9          | 23.7        |
| Framingham         | 76.7   | 86.7             | 11.1                                   | 8.9                         | 35.6                                   | 44.4              | 0.0          | 20.0        |
| Haverhill          | 62.7   | 96.6             | 10.2                                   | 8.5                         | 32.2                                   | 44.1              | 10.2         | 13.6        |
| Lawrence           | 85.6   | 94.0             | 10.1                                   | 11.1                        | 23.0                                   | 40.1              | 22.1         | 14.7        |
| Leominster         | 81.8   | 86.4             | 0.0                                    | 4.6                         | 36.4                                   | 27.3              | 9.1          | 27.3        |
| Lowell             | 83.3   | 92.6             | 8.4                                    | 7.4                         | 20.7                                   | 35.0              | 14.3         | 30.0        |
| Lynn               | 83.4   | 91.1             | 10.3                                   | 8.9                         | 35.6                                   | 27.4              | 11.6         | 25.3        |
| Malden             | 60.9   | 91.3             | 8.7                                    | 13.0                        | 43.5                                   | 30.4              | 13.0         | 13.0        |
| Medford            | 76.9   | 84.6             | 15.4                                   | 15.4                        | 23.1                                   | 38.5              | 7.7          | 30.8        |
| Methuen            | 57.1   | 91.7             | 8.3                                    | 5.6                         | 25.0                                   | 41.7              | 19.4         | 13.9        |
| New Bedford        | 73.7   | 94.8             | 10.4                                   | 8.1                         | 29.2                                   | 39.8              | 10.5         | 20.5        |
| Newton             | 75.0   | 100.0            | 0.0                                    | 0.0                         | 25.0                                   | 50.0              | 25.0         | 0.0         |
| Peabody            | 86.7   | 86.7             | 20.0                                   | 26.7                        | 35.7                                   | 35.7              | 14.3         | 14.3        |
| Pittsfield         | 83.3   | 91.0             | 9.0                                    | 10.4                        | 11.9                                   | 31.3              | 32.8         | 23.9        |
| Plymouth           | 53.8   | 92.3             | 0.0                                    | 0.0                         | 26.9                                   | 30.8              | 7.7          | 34.6        |
| Quincy             | 72.9   | 89.6             | 2.1                                    | 4.2                         | 20.8                                   | 41.7              | 16.7         | 20.8        |
| Revere             | 85.4   | 79.2             | 10.4                                   | 8.3                         | 47.8                                   | 21.7              | 4.4          | 26.1        |
| Somerville         | 80.6   | 89.2             | 5.4                                    | 8.1                         | 35.1                                   | 40.5              | 8.1          | 16.2        |
| Springfield        | 92.3   | 96.8             | 12.6                                   | 12.0                        | 27.3                                   | 35.1              | 9.7          | 28.0        |
| Taunton            | 80.4   | 96.2             | 11.3                                   | 5.7                         | 26.9                                   | 46.2              | 15.4         | 11.5        |
| Waltham            | 57.1   | 77.3             | 4.6                                    | 9.1                         | 36.4                                   | 31.8              | 0.0          | 31.8        |
| Weymouth           | 90.9   | 81.8             | 18.2                                   | 18.2                        | 59.1                                   | 22.7              | 4.6          | 13.6        |
| Worcester          | 75.2   | 93.9             | 8.8                                    | 12.3                        | 30.5                                   | 46.3              | 10.0         | 13.1        |

NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.

1. The 30 largest municipalities are the cities and towns in Massachusetts with the largest populations according to the Massachusetts (Department of Public Health) Modified Age, Race/Ethnicity, & Sex Estimates 2005 (MMARS05), released October, 2006 (see Technical Notes in Appendix). 2. Birth rates represent the number of births per 1,000 females age 15-19. 3. Mothers who designated themselves as Asian, American Indian, or Other. 4. See Glossary under "Prenatal Care Payment Source." 5. Calculations based on fewer than five teen births overall are excluded. 6. Less than 2,500 grams or 5.5 pounds. 7. Less than 37 weeks gestational age. 8. Based on Adequacy of Prenatal Care Utilization (APNCU) Index. Please see Glossary and Technical Notes in the Appendix for definitions of index and adequacy categories.

**Table 21. Trends in Infant, Neonatal, and Post Neonatal Mortality, by Race<sup>1</sup>, Massachusetts: 1980-2005**

| <b>INFANT MORTALITY (less than one year of age)</b> |                                |                         |              |                         |              |                         |                                |             |
|---|--------------------------------|-------------------------|--------------|-------------------------|--------------|-------------------------|--------------------------------|-------------|
| <b>Year</b>   | <b>State Total<sup>2</sup></b> |                         | <b>White</b> |                         | <b>Black</b> |                         | <b>Asian/Other<sup>3</sup></b> |             |
|   | <b>n</b>                       | <b>Rate<sup>4</sup></b> | <b>n</b>     | <b>Rate<sup>4</sup></b> | <b>n</b>     | <b>Rate<sup>4</sup></b> | <b>n</b>                       | <b>Rate</b> |
| <b>1980</b>   | 748                            | 10.3                    | 655          | 9.8                     | 87           | 18.6                    | 5                              | 4.6         |
| <b>1981</b>   | 710                            | 9.6                     | 616          | 9.1                     | 85           | 18.2                    | 8                              | 6.1         |
| <b>1982</b>   | 764                            | 10.1                    | 656          | 9.4                     | 102          | 21.3                    | 5                              | 3.3         |
| <b>1983</b>   | 682                            | 9.0                     | 579          | 8.3                     | 89           | 19.0                    | 12                             | 7.4         |
| <b>1984</b>   | 699                            | 8.9                     | 601          | 8.4                     | 82           | 16.4                    | 13                             | 7.5         |
| <b>1985</b>   | 745                            | 9.1                     | 608          | 8.1                     | 126          | 23.8                    | 11                             | 6.1         |
| <b>1986</b>   | 695                            | 8.4                     | 560          | 7.5                     | 123          | 22.0                    | 11                             | 4.6         |
| <b>1987</b>   | 608                            | 7.2                     | 486          | 6.4                     | 110          | 17.5                    | 12                             | 4.5         |
| <b>1988</b>   | 693                            | 7.9                     | 546          | 7.0                     | 133          | 19.5                    | 13                             | 3.8         |
| <b>1989</b>   | 697                            | 7.6                     | 549          | 6.8                     | 131          | 17.7                    | 17                             | 4.8         |
| <b>1990</b>   | 649                            | 7.0                     | 519          | 6.4                     | 106          | 13.7                    | 24                             | 6.5         |
| <b>1991</b>   | 577                            | 6.5                     | 461          | 6.0                     | 102          | 13.8                    | 14                             | 3.9         |
| <b>1992</b>   | 569                            | 6.5                     | 438          | 5.7                     | 114          | 15.8                    | 17                             | 4.7         |
| <b>1993</b>   | 523                            | 6.2                     | 423          | 5.7                     | 87           | 12.5                    | 13                             | 3.5         |
| <b>1994</b>   | 499                            | 6.0                     | 407          | 5.6                     | 81           | 12.0                    | 11                             | 2.9         |
| <b>1995</b>   | 419                            | 5.1                     | 333          | 4.7                     | 65           | 10.3                    | 21                             | 5.5         |
| <b>1996</b>   | 403                            | 5.0                     | 329          | 4.7                     | 65           | 10.8                    | 8                              | 2.0         |
| <b>1997</b>   | 425                            | 5.3                     | 349          | 5.0                     | 66           | 10.6                    | 10                             | 2.4         |
| <b>1998</b>   | 414                            | 5.1                     | 345          | 4.9                     | 59           | 9.3                     | 10                             | 2.3         |
| <b>1999</b>   | 418                            | 5.2                     | 334          | 4.8                     | 75           | 11.4                    | 9                              | 1.9         |
| <b>2000</b>   | 377                            | 4.6                     | 280          | 4.0                     | 76           | 11.7                    | 19                             | 3.6         |
| <b>2001</b>   | 407                            | 5.0                     | 314          | 4.5                     | 77           | 11.7                    | 16                             | 3.0         |
| <b>2002</b>   | 397                            | 4.9                     | 306          | 4.5                     | 74           | 11.1                    | 17                             | 2.9         |
| <b>2003</b>   | 383                            | 4.8                     | 290          | 4.3                     | 78           | 11.8                    | 15                             | 2.6         |
| <b>2004</b>   | 376                            | 4.8                     | 285          | 4.3                     | 75           | 11.1                    | 15                             | 2.5         |
| <b>2005</b>   | 391                            | 5.1                     | 308          | 4.8                     | 63           | 9.3                     | 20                             | 3.5         |

**Table 21 (cont'd). Trends in Infant, Neonatal, and Post Neonatal Mortality, by Race<sup>1</sup>, Massachusetts: 1980-2005**

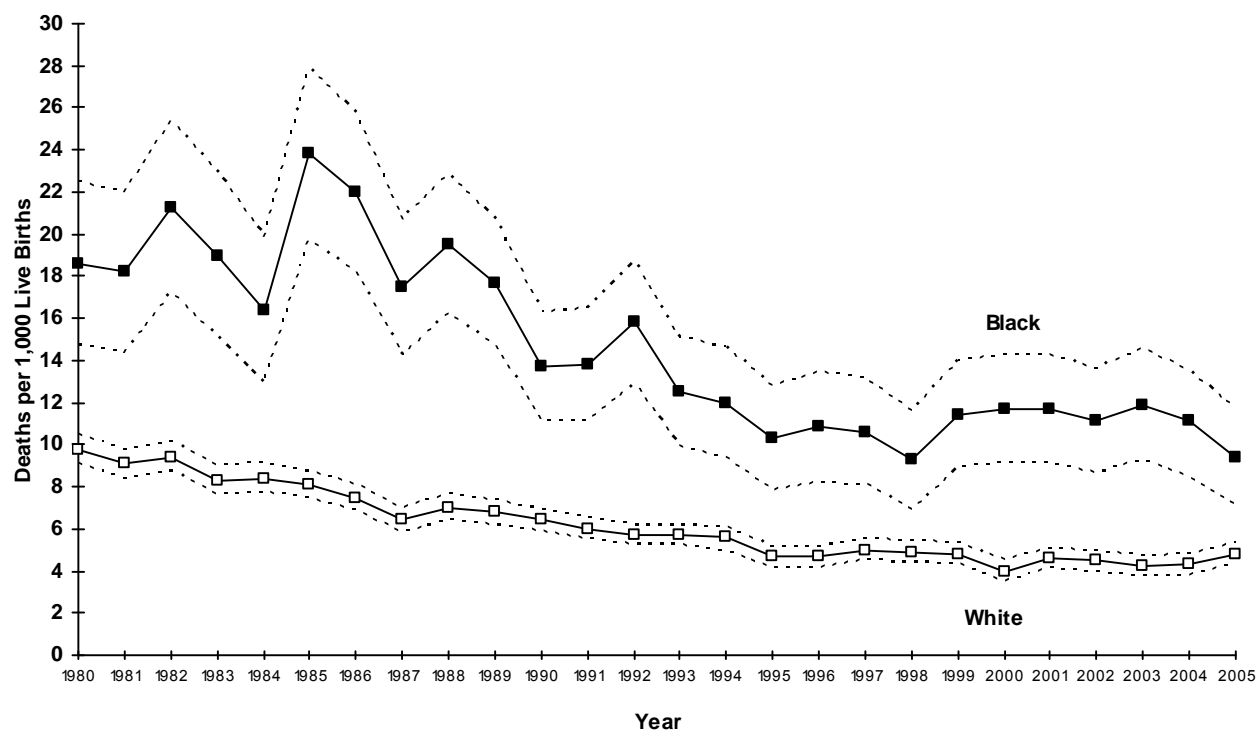
| <b>NEONATAL MORTALITY (birth to 27 days)</b> |                                |                         |              |                         |              |                         |                                |                         |
|--|--------------------------------|-------------------------|--------------|-------------------------|--------------|-------------------------|--------------------------------|-------------------------|
| <b>Year</b>                                  | <b>State Total<sup>2</sup></b> |                         | <b>White</b> |                         | <b>Black</b> |                         | <b>Asian/Other<sup>3</sup></b> |                         |
|  | <b>n</b>                       | <b>Rate<sup>4</sup></b> | <b>n</b>     | <b>Rate<sup>4</sup></b> | <b>n</b>     | <b>Rate<sup>4</sup></b> | <b>n</b>                       | <b>Rate<sup>4</sup></b> |
| <b>1980</b>                                  | 550                            | 7.6                     | 483          | 7.2                     | 62           | 13.3                    | 5                              | 4.6                     |
| <b>1981</b>                                  | 510                            | 6.9                     | 442          | 6.5                     | 59           | 12.4                    | 5                              | 3.8                     |
| <b>1982</b>                                  | 573                            | 7.6                     | 494          | 7.1                     | 75           | 15.7                    | 3                              | -- <sup>5</sup>         |
| <b>1983</b>                                  | 482                            | 6.3                     | 411          | 5.9                     | 63           | 13.4                    | 7                              | 4.3                     |
| <b>1984</b>                                  | 472                            | 6.0                     | 411          | 5.8                     | 49           | 9.8                     | 8                              | 4.6                     |
| <b>1985</b>                                  | 538                            | 6.6                     | 447          | 6.0                     | 85           | 16.0                    | 5                              | 2.8                     |
| <b>1986</b>                                  | 478                            | 5.8                     | 383          | 5.2                     | 89           | 15.9                    | 5                              | 2.1                     |
| <b>1987</b>                                  | 432                            | 5.1                     | 343          | 4.6                     | 80           | 12.7                    | 9                              | 3.4                     |
| <b>1988</b>                                  | 477                            | 5.4                     | 383          | 4.9                     | 87           | 12.8                    | 6                              | 1.8                     |
| <b>1989</b>                                  | 479                            | 5.2                     | 376          | 4.7                     | 95           | 12.8                    | 8                              | 2.3                     |
| <b>1990</b>                                  | 446                            | 4.8                     | 347          | 4.3                     | 80           | 10.3                    | 9                              | 5.1                     |
| <b>1991</b>                                  | 401                            | 4.5                     | 319          | 4.1                     | 72           | 9.8                     | 10                             | 2.8                     |
| <b>1992</b>                                  | 415                            | 4.8                     | 325          | 4.3                     | 79           | 10.9                    | 11                             | 3.1                     |
| <b>1993</b>                                  | 375                            | 4.4                     | 300          | 4.1                     | 66           | 9.5                     | 9                              | 2.4                     |
| <b>1994</b>                                  | 349                            | 4.2                     | 280          | 3.8                     | 60           | 8.9                     | 9                              | 2.4                     |
| <b>1995</b>                                  | 298                            | 3.6                     | 237          | 3.3                     | 50           | 7.9                     | 11                             | 2.9                     |
| <b>1996</b>                                  | 290                            | 3.6                     | 249          | 3.5                     | 35           | 5.8                     | 5                              | 1.2                     |
| <b>1997</b>                                  | 323                            | 4.0                     | 271          | 3.9                     | 45           | 7.2                     | 7                              | 1.7                     |
| <b>1998</b>                                  | 315                            | 3.9                     | 261          | 3.7                     | 47           | 7.4                     | 7                              | 1.6                     |
| <b>1999</b>                                  | 332                            | 4.1                     | 265          | 3.8                     | 61           | 9.3                     | 6                              | 1.3                     |
| <b>2000</b>                                  | 288                            | 3.5                     | 214          | 3.1                     | 58           | 8.9                     | 14                             | 2.7                     |
| <b>2001</b>                                  | 308                            | 3.8                     | 239          | 3.5                     | 59           | 9.0                     | 10                             | 1.9                     |
| <b>2002</b>                                  | 299                            | 3.7                     | 235          | 3.4                     | 51           | 7.6                     | 13                             | 2.2                     |
| <b>2003</b>                                  | 285                            | 3.6                     | 217          | 3.2                     | 58           | 8.8                     | 10                             | 1.8                     |
| <b>2004</b>                                  | 291                            | 3.7                     | 224          | 3.4                     | 54           | 8.0                     | 13                             | 2.2                     |
| <b>2005</b>                                  | 282                            | 3.7                     | 226          | 3.5                     | 45           | 6.6                     | 11                             | 1.9                     |

**Table 21 (cont'd). Trends in Infant, Neonatal, and Post Neonatal Mortality, by Race<sup>1</sup>, Massachusetts: 1980-2005**

| <b>POST NEONATAL MORTALITY (28-364 days)</b> |                                |                         |              |                         |              |                         |                                |                         |
|--|--------------------------------|-------------------------|--------------|-------------------------|--------------|-------------------------|--------------------------------|-------------------------|
| <b>Year</b>                                  | <b>State Total<sup>2</sup></b> |                         | <b>White</b> |                         | <b>Black</b> |                         | <b>Asian/Other<sup>3</sup></b> |                         |
|  | <b>n</b>                       | <b>Rate<sup>4</sup></b> | <b>n</b>     | <b>Rate<sup>4</sup></b> | <b>n</b>     | <b>Rate<sup>4</sup></b> | <b>n</b>                       | <b>Rate<sup>4</sup></b> |
| <b>1980</b>                                  | 198                            | 2.7                     | 172          | 2.6                     | 25           | 5.3                     | 0                              | 0.0                     |
| <b>1981</b>                                  | 200                            | 2.7                     | 174          | 2.6                     | 26           | 5.8                     | 3                              | -- <sup>5</sup>         |
| <b>1982</b>                                  | 191                            | 2.5                     | 162          | 2.3                     | 27           | 5.6                     | 2                              | -- <sup>5</sup>         |
| <b>1983</b>                                  | 200                            | 2.7                     | 168          | 2.4                     | 26           | 5.6                     | 5                              | 3.1                     |
| <b>1984</b>                                  | 227                            | 2.9                     | 190          | 2.6                     | 33           | 6.6                     | 5                              | 2.9                     |
| <b>1985</b>                                  | 207                            | 2.5                     | 161          | 2.1                     | 41           | 7.8                     | 6                              | 3.3                     |
| <b>1986</b>                                  | 217                            | 2.6                     | 177          | 2.3                     | 34           | 6.1                     | 6                              | 2.5                     |
| <b>1987</b>                                  | 176                            | 2.1                     | 143          | 1.8                     | 30           | 4.8                     | 3                              | -- <sup>5</sup>         |
| <b>1988</b>                                  | 216                            | 2.5                     | 163          | 2.1                     | 46           | 6.7                     | 7                              | 2.0                     |
| <b>1989</b>                                  | 218                            | 2.4                     | 173          | 2.1                     | 36           | 4.9                     | 9                              | 2.5                     |
| <b>1990</b>                                  | 203                            | 2.2                     | 172          | 2.1                     | 26           | 3.4                     | 5                              | 1.4                     |
| <b>1991</b>                                  | 176                            | 2.0                     | 142          | 1.8                     | 30           | 4.1                     | 4                              | -- <sup>5</sup>         |
| <b>1992</b>                                  | 154                            | 1.8                     | 113          | 1.5                     | 35           | 4.8                     | 6                              | 1.7                     |
| <b>1993</b>                                  | 148                            | 1.7                     | 123          | 1.7                     | 21           | 3.0                     | 4                              | -- <sup>5</sup>         |
| <b>1994</b>                                  | 150                            | 1.8                     | 127          | 1.7                     | 21           | 3.1                     | 2                              | -- <sup>5</sup>         |
| <b>1995</b>                                  | 121                            | 1.5                     | 96           | 1.3                     | 15           | 2.4                     | 10                             | 2.6                     |
| <b>1996</b>                                  | 113                            | 1.4                     | 80           | 1.1                     | 30           | 5.0                     | 3                              | -- <sup>5</sup>         |
| <b>1997</b>                                  | 102                            | 1.3                     | 78           | 1.1                     | 21           | 3.4                     | 3                              | -- <sup>5</sup>         |
| <b>1998</b>                                  | 99                             | 1.2                     | 84           | 1.2                     | 12           | 1.9                     | 3                              | -- <sup>5</sup>         |
| <b>1999</b>                                  | 86                             | 1.1                     | 69           | 1.0                     | 14           | 2.1                     | 3                              | -- <sup>5</sup>         |
| <b>2000</b>                                  | 89                             | 1.1                     | 66           | 0.9                     | 18           | 2.8                     | 5                              | 1.0                     |
| <b>2001</b>                                  | 99                             | 1.2                     | 75           | 1.1                     | 18           | 2.7                     | 6                              | 1.1                     |
| <b>2002</b>                                  | 98                             | 1.2                     | 71           | 1.0                     | 23           | 3.4                     | 4                              | -- <sup>5</sup>         |
| <b>2003</b>                                  | 98                             | 1.2                     | 73           | 1.1                     | 20           | 3.0                     | 5                              | 0.9                     |
| <b>2004</b>                                  | 85                             | 1.1                     | 61           | 0.9                     | 21           | 3.1                     | 3                              | -- <sup>5</sup>         |
| <b>2005</b>                                  | 109                            | 1.4                     | 82           | 1.3                     | 18           | 2.7                     | 7                              | 1.6                     |

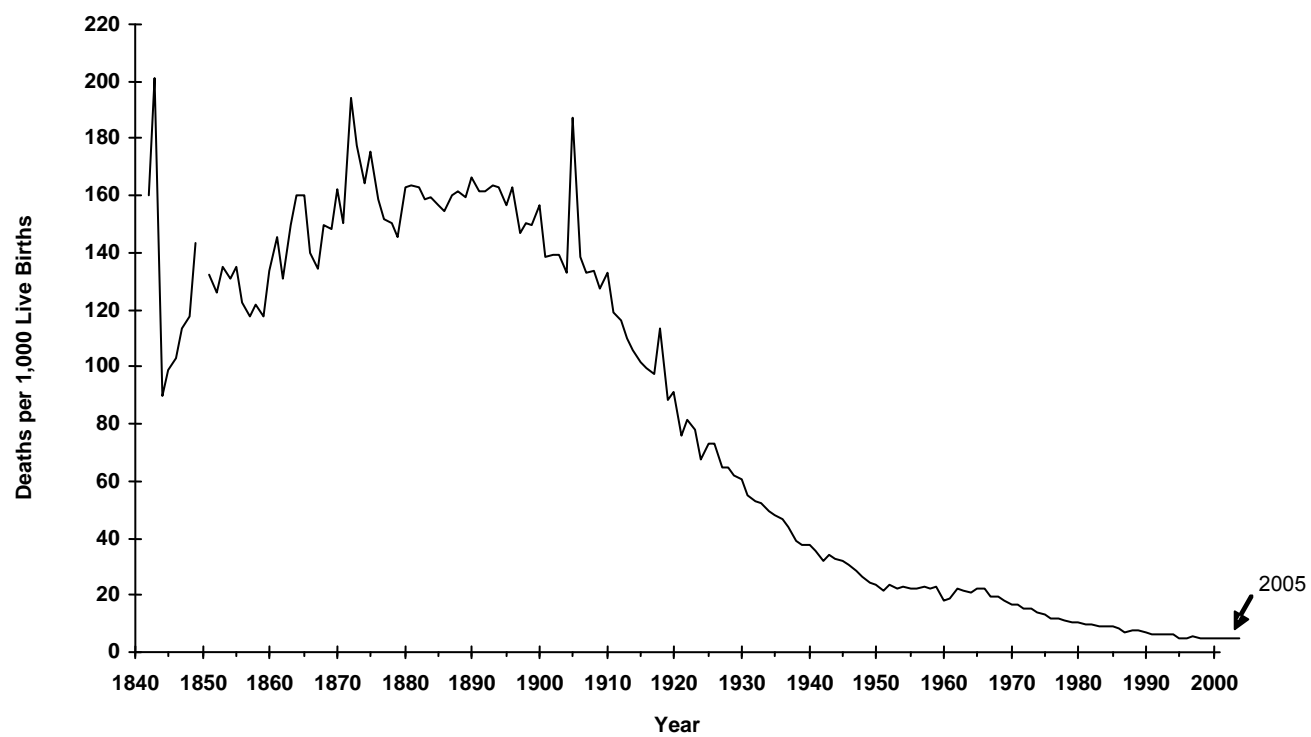
1. Hispanic origin could not be identified from the Massachusetts death certificate before 1989; thus, Hispanic trend data are not available. Most Hispanics are included in the race category of White. Hispanic infant mortality data for the years 1990 through 2005 are presented in Table 11. 2. Deaths of infants of unknown race are included in the total calculation. For rate computations, infants of unknown race are allocated into the race categories according to the distribution of births of known race. 3. Other: American Indian and Other races. 4. Rates are expressed per 1,000 live births. 5. Calculations based on fewer than five events are excluded.

**Figure 16. Infant Mortality Rates and 95% Confidence Intervals<sup>1</sup> by Race<sup>2</sup>,  
Massachusetts: 1980-2005<sup>3</sup>**



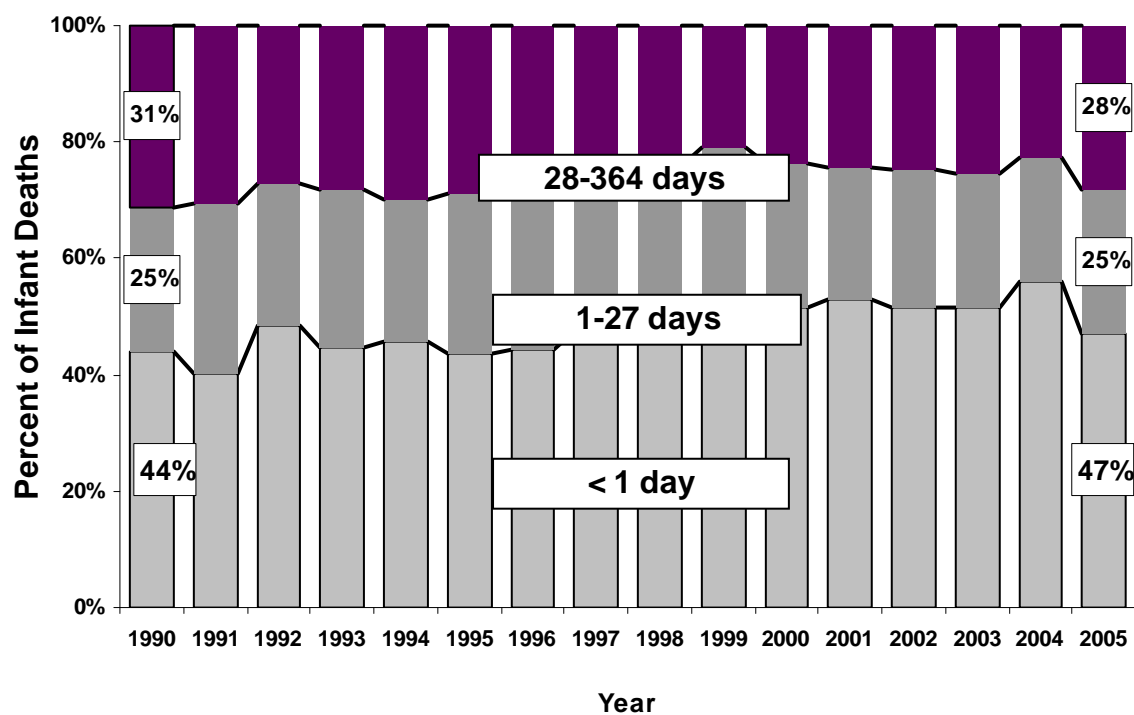
1. See Technical Notes for explanation. 2. For rate computations, infant births of unknown race are allocated into race categories according to the distribution of the births of known race. 3. On tables and graphs which include data prior to June 1986, the race classifications do not include ethnicity; most Hispanics are included in the race category of whites.

**Figure 17. Infant Mortality Rates, Massachusetts: 1842-2005<sup>1</sup>**



1. Data not available for 1850.

**Figure 18. Trends in the Timing of Infant Deaths, Massachusetts: 1990-2005**



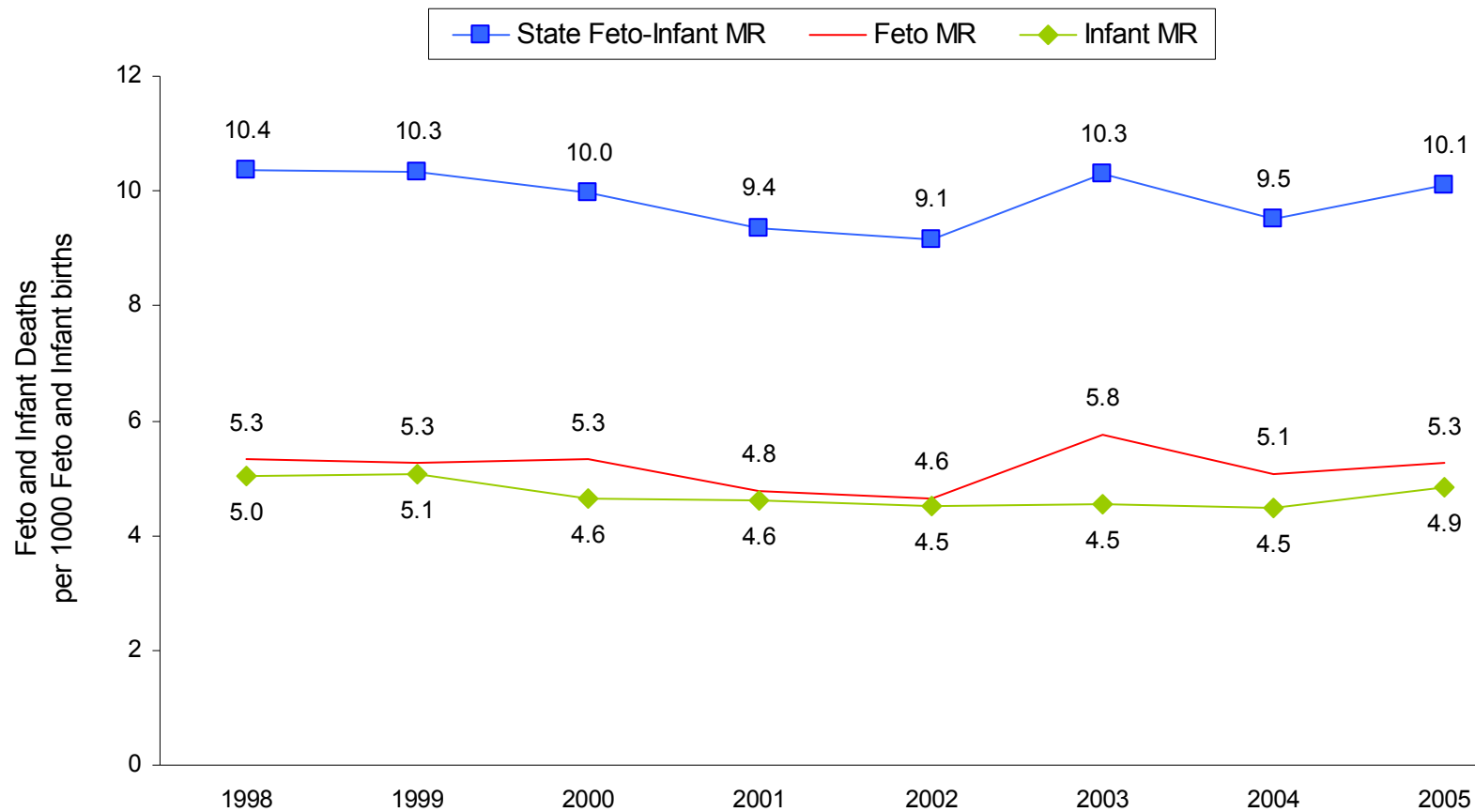


**Table 22. Feto-Infant Mortality Rate<sup>1</sup> by Birthweight, Massachusetts: 1999-2005**

| <b>Birthweight<br/>(in grams)</b>    | <b>1999</b> | <b>2000</b> | <b>2001</b> | <b>2002</b> | <b>2003</b> | <b>2004</b> | <b>2005</b> |
|--------------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| <b>&lt;500</b>                       | 962.8       | 943.2       | 940.2       | 938.3       | 943.5       | 923.1       | 912.0       |
| <b>500-749</b>                       | 576.5       | 544.1       | 500.0       | 487.0       | 525.5       | 523.4       | 561.8       |
| <b>750-999</b>                       | 170.8       | 247.2       | 182.2       | 146.9       | 188.6       | 220.7       | 157.7       |
| <b>1,000-1,249</b>                   | 104.9       | 112.4       | 125.4       | 83.0        | 131.4       | 142.9       | 124.1       |
| <b>1,250-1,499</b>                   | 64.4        | 65.8        | 84.6        | 84.6        | 95.8        | 67.7        | 74.4        |
| <b>1,500-1,999</b>                   | 53.9        | 35.2        | 41.8        | 40.3        | 38.3        | 31.3        | 38.0        |
| <b>2,000-2,499</b>                   | 10.8        | 15.2        | 15.3        | 12.2        | 11.9        | 16.4        | 14.8        |
| <b>2,500-4,000</b>                   | 2.4         | 2.4         | 2.2         | 2.6         | 2.5         | 2.3         | 2.5         |
| <b>4,001+</b>                        | 1.8         | 2.3         | 1.5         | 1.5         | 1.7         | 2.5         | 1.3         |
| <b>Unknown birthweight (N)</b>       | (26)        | (34)        | (37)        | (23)        | (17)        | (30)        | (19)        |
| <b><i>State Feto-Infant Rate</i></b> | <b>10.3</b> | <b>9.9</b>  | <b>9.7</b>  | <b>9.1</b>  | <b>10.3</b> | <b>9.5</b>  | <b>10.1</b> |

<sup>1</sup> Fetal and Infant deaths per 1,000 live births plus fetal deaths.

**Figure 19. Feto-Infant Mortality Rate, Massachusetts: 1998-2005**

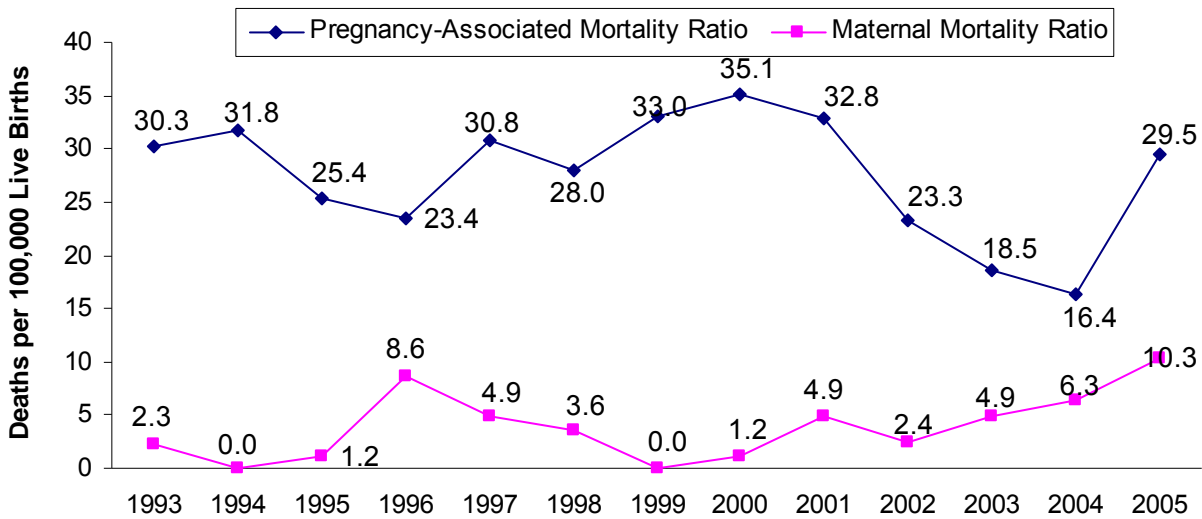


\* Calculation of Infant Mortality Rate in this section differs from previous section in the inclusion of fetal deaths in the denominator.  
 Note: Total Feto, Infant, and Feto-Infant Mortality Rates include cases with unknown birthweight. The Fetal Mortality Rate and Infant Mortality Rate may not add up to the Feto-Infant Mortality Rate due to rounding.

Table 23. Fetal and Infant Deaths by Birthweight and Gestational Age, Massachusetts: 1998-2005

| <u>Year</u> | <u>Fetals</u><br>( <u>&lt;24 wks or</u><br><u>&lt;500 grams</u> ) | <u>Fetals</u><br>( <u>&gt;=24 wks and</u><br><u>&gt;= 500 grams</u> ) | <u>Infants</u><br>( <u>&lt;24 wks or</u><br><u>&lt;500 grams</u> ) | <u>Infants</u><br>( <u>&gt;=24 wks and</u><br><u>&gt;= 500 grams</u> ) | <u>Total</u> |
|-------------|---|---|--|--|--------------|
| 1998        | 216 (25.5%)   | 219 (25.8%)   | 183 (21.6%)  | 230 (27.1%)  | 848 (100%)   |
| 1999        | 214 (25.4%)   | 215 (25.6%)   | 196 (23.3%)  | 216 (25.7%)  | 841 (100%)   |
| 2000        | 203 (25.1%)   | 234 (28.9%)   | 168 (20.7%)  | 205 (25.3%)  | 810 (100%)   |
| 2001        | 174 (22.0%)   | 214 (27.1%)   | 197 (24.9%)  | 206 (26.0%)  | 791 (100%)   |
| 2002        | 165 (22.3%)   | 210 (28.3%)   | 185 (25.0%)  | 181 (24.4%)  | 741 (100%)   |
| 2003        | 218 (26.3%)   | 246 (29.6%)   | 189 (22.8%)  | 177 (21.3%)  | 830 (100%)   |
| 2004        | 177 (22.7%)   | 240 (30.8%)   | 182 (23.3%)  | 181 (23.2%)  | 780 (100%)   |
| 2005        | 210 (26.3%)   | 213 (26.7%)   | 174 (21.8%)  | 201 (25.2%)  | 798 (100%)   |

**Figure 20. Trends in Pregnancy-Associated<sup>1</sup> and Maternal Mortality<sup>2</sup>, Massachusetts: 1993-2005**



NOTE: Ratios shown in graph are per 100,000 live births. Ratios are based on occurrence births, not resident births.

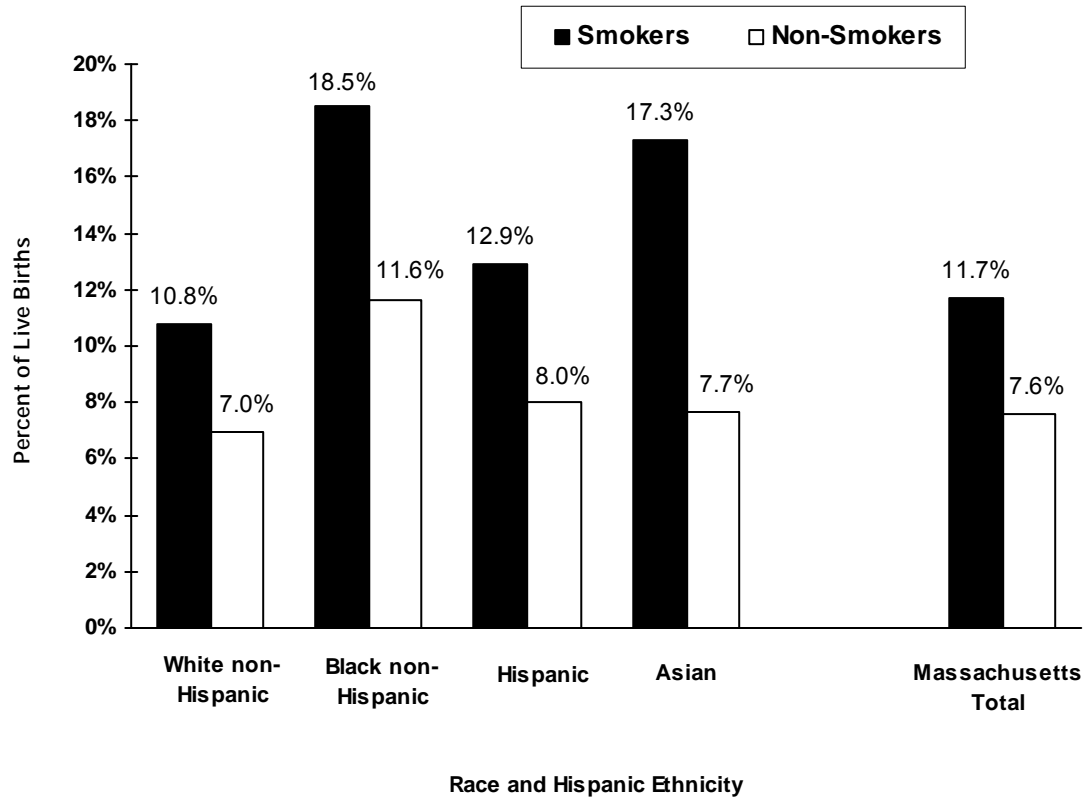
1. Pregnancy-associated death is defined as the death of a woman while pregnant or within one year of termination of pregnancy, irrespective of cause. The pregnancy-associated mortality ratio is the number of pregnancy-associated deaths per 100,000 live occurrence births (see Definition of Rates and Technical Notes in Appendix for further information). 2. Maternal death is defined as the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration or site of the pregnancy, from any cause related to or aggravated by pregnancy or its management, but not from accidental or incidental causes. Maternal mortality ratio is the number of maternal deaths per 100,000 live occurrence births (see Definition of Rates and Technical Notes in Appendix for more information.)

**Table 24. Number of Pregnancy-Associated<sup>1</sup> and Maternal Mortality<sup>2</sup>, Massachusetts: 1994-2005**

| Year                                     | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 |
|--|------|------|------|------|------|------|------|------|------|------|------|------|
| Pregnancy-Associated Deaths <sup>1</sup> | 27   | 21   | 19   | 25   | 23   | 27   | 29   | 27   | 19   | 15   | 13   | 23   |
| Maternal Deaths <sup>2</sup>             | 0    | 1    | 7    | 4    | 3    | 0    | 1    | 4    | 2    | 4    | 5    | 8    |

1. Pregnancy-associated death is defined as the death of a woman while pregnant or within one year of termination of pregnancy, irrespective of cause. The pregnancy-associated mortality ratio is the number of pregnancy-associated deaths per 100,000 live occurrence births (see Definition of Rates and Technical Notes in Appendix for further information). 2. Maternal death is defined as the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration or site of the pregnancy, from any cause related to or aggravated by pregnancy or its management, but not from accidental or incidental causes. Maternal mortality ratio is the number of maternal deaths per 100,000 live occurrence births (see Definition of Rates and Technical Notes in Appendix for more information.)

**Figure 21. Low Birthweight<sup>1</sup> Among Smoking and Nonsmoking<sup>2</sup> Mothers, by Race and Hispanic Ethnicity, Massachusetts: 2005**



NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated. Maternal smoking is self-reported on the Parent Worksheet of the Birth Certificate; these data should be interpreted cautiously.

1. Low birthweight: less than 2,500 grams or 5.5 pounds. 2. Based on information provided on the Parent Worksheet of the Birth Certificates.

**Table 25. Low Birthweight (LBW)<sup>1</sup> by Maternal Age, Race and Hispanic Ethnicity, Massachusetts: 2005**

| <b>Mother's Age<br/>(in years)</b> | <b>Total LBW<br/>Infants</b> |                      | <b>White non-<br/>Hispanic</b> |                      | <b>Black non-<br/>Hispanic</b> |                      | <b>Hispanic</b> |                      | <b>Asian</b> |                      | <b>Other<sup>4</sup></b> |                      | <b>Unknown<sup>5</sup></b> |
|------------------------------------|------------------------------|----------------------|--------------------------------|----------------------|--------------------------------|----------------------|-----------------|----------------------|--------------|----------------------|--------------------------|----------------------|----------------------------|
|                                    | <b>n</b>                     | <b>%<sup>3</sup></b> | <b>n</b>                       | <b>%<sup>3</sup></b> | <b>n</b>                       | <b>%<sup>3</sup></b> | <b>n</b>        | <b>%<sup>3</sup></b> | <b>n</b>     | <b>%<sup>3</sup></b> | <b>n</b>                 | <b>%<sup>3</sup></b> | <b>n</b>                   |
| <b>State Total<sup>2</sup></b>     | <b>6,073</b>                 | <b>7.9</b>           | <b>3,897</b>                   | <b>7.3</b>           | <b>731</b>                     | <b>12.0</b>          | <b>828</b>      | <b>8.2</b>           | <b>409</b>   | <b>7.8</b>           | <b>203</b>               | <b>10.9</b>          | <b>6</b>                   |
| <b>&lt;18</b>                      | 177                          | 11.8                 | 48                             | 8.8                  | 31                             | 15.0                 | 75              | 12.3                 | 11           | 16.7                 | 12                       | 17.4                 | 0                          |
| <b>18-19</b>                       | 289                          | 9.3                  | 134                            | 8.7                  | 42                             | 10.6                 | 85              | 9.0                  | 12           | 12.4                 | 16                       | 13.0                 | 0                          |
| <b>20-24</b>                       | 899                          | 7.6                  | 434                            | 6.7                  | 157                            | 12.4                 | 216             | 7.1                  | 48           | 9.2                  | 42                       | 9.1                  | 2                          |
| <b>25-29</b>                       | 1,328                        | 7.4                  | 769                            | 6.5                  | 175                            | 10.7                 | 218             | 8.3                  | 108          | 7.7                  | 56                       | 11.3                 | 2                          |
| <b>30-34</b>                       | 1,755                        | 7.3                  | 1,280                          | 6.9                  | 156                            | 11.1                 | 131             | 7.2                  | 147          | 7.5                  | 41                       | 9.3                  | 0                          |
| <b>35-39</b>                       | 1,252                        | 8.5                  | 939                            | 8.0                  | 128                            | 14.4                 | 88              | 10.8                 | 68           | 6.9                  | 27                       | 12.2                 | 2                          |
| <b>40+</b>                         | 372                          | 10.6                 | 292                            | 10.6                 | 41                             | 15.2                 | 15              | 7.4                  | 15           | 6.9                  | 9                        | 15.5                 | 0                          |

NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.

1. Low Birthweight (LBW): less than 2,500 grams or 5.5 pounds at birth. 2. State totals include women of unknown age. 3. Percentages are based upon the number of low birthweight infants divided by the total births in each age and race/ethnicity category. 4. Other races include American Indian and others not specified. 5. Race and/or mother's age unknown.

**Table 26. Adequacy of Prenatal Care Utilization<sup>1</sup>: Summary and Component Indices, Massachusetts: 2005**

|   | Adequate Total <sup>2</sup> |      | Adequate Intensive <sup>3</sup> |      | Adequate Basic <sup>3</sup> |      | Intermediate <sup>3</sup> |     | Inadequate <sup>3</sup> |     | Unknown <sup>3</sup> |  |
|---|-----------------------------|------|---------------------------------|------|-----------------------------|------|---------------------------|-----|-------------------------|-----|----------------------|--|
|   | n                           | %    | n                               | %    | n                           | %    | n                         | %   | n                       | %   | n                    |  |
| <b><u>Summary Index<sup>4</sup></u></b>     |                             |      |                                 |      |                             |      |                           |     |                         |     |                      |  |
| Adequacy of Prenatal Care Utilization       | 63,748                      | 84.0 | 29,633                          | 39.0 | 34,115                      | 45.0 | 5,722                     | 7.5 | 6,424                   | 8.5 | 930                  |  |
| <b><u>Component Indices<sup>4</sup></u></b> |                             |      |                                 |      |                             |      |                           |     |                         |     |                      |  |
| Adequacy of Initiation                      | 69,976                      | 92.2 | 30,982                          | 40.8 | 38,994                      | 51.4 | 3,700                     | 4.9 | 2,218                   | 2.9 | 930                  |  |
| Adequacy of Received Services (Visits)      | 68,717                      | 90.5 | 33,478                          | 44.1 | 35,239                      | 46.4 | 6,293                     | 8.3 | 884                     | 1.2 | 930                  |  |

NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.

1. Based on the Adequacy of Prenatal Care Utilization (APNCU) Index. 2. Adequate Total is the sum of Adequate Intensive and Adequate Basic categories. 3. For definitions of these categories, please see the Technical Notes in the Appendix. 4. For an explanation of the APNCU Index (summary index) and its component indices, please see Technical Notes in the Appendix.

**Table 27. Adequacy of Prenatal Care<sup>1</sup> by Selected Characteristics, Massachusetts: 2005**

|                                | <u>Adequate Total</u> <sup>2</sup> |              | <u>Adequate Intensive</u> |              | <u>Adequate Basic</u> |              | <u>Intermediate</u> |                | <u>Inadequate</u> |             | <u>Unknown</u> |
|--------------------------------|------------------------------------|--------------|---------------------------|--------------|-----------------------|--------------|---------------------|----------------|-------------------|-------------|----------------|
|                                | n                                  | %            | n                         | %            | n                     | %            | n                   | %              | N                 | %           | n              |
| <b>State Total</b>             | <b>63,748</b>                      | <b>84.0%</b> | <b>29,633</b>             | <b>39.0%</b> | <b>34,115</b>         | <b>45.0%</b> | <b>5,722</b>        | <b>7.5%</b>    | <b>6,424</b>      | <b>8.5%</b> | <b>930</b>     |
| <b>Age</b>                     | <b>Maternal Demographics</b>       |              |                           |              |                       |              |                     |                |                   |             |                |
| <18                            | 974                                | 66.2%        | 468                       | 31.8%        | 506                   | 34.4%        | 139                 | 9.4%           | 359               | 24.4%       | 27             |
| 18-19                          | 2,176                              | 71.1%        | 983                       | 32.1%        | 1,193                 | 39.0%        | 333                 | 10.9%          | 550               | 18.0%       | 40             |
| 20-24                          | 8,853                              | 76.1%        | 4,050                     | 34.8%        | 4,803                 | 41.3%        | 1,055               | 9.1%           | 1,723             | 14.8%       | 174            |
| 25-29                          | 14,905                             | 83.8%        | 6,823                     | 38.4%        | 8,082                 | 45.4%        | 1,422               | 8.0%           | 1,462             | 8.2%        | 237            |
| 30-34                          | 20,921                             | 87.6%        | 9,435                     | 39.5%        | 11,486                | 48.1%        | 1,645               | 6.9%           | 1,326             | 5.5%        | 248            |
| 35-39                          | 12,872                             | 88.3%        | 6,265                     | 43.0%        | 6,607                 | 45.3%        | 921                 | 6.3%           | 785               | 5.4%        | 162            |
| 40+                            | 3,045                              | 87.8%        | 1,608                     | 46.3%        | 1,437                 | 41.4%        | 206                 | 5.9%           | 219               | 6.3%        | 41             |
| <b>Educational Attainment</b>  |                                    |              |                           |              |                       |              |                     |                |                   |             |                |
| < than High School             | 5,392                              | 69.4%        | 2,681                     | 34.5%        | 2,711                 | 34.9%        | 806                 | 10.4%          | 1,571             | 20.2%       | 180            |
| High School                    | 15,270                             | 80.1%        | 7,061                     | 37.0%        | 8,209                 | 43.1%        | 1,640               | 8.6%           | 2,151             | 11.3%       | 251            |
| Some college                   | 14,180                             | 84.9%        | 6,945                     | 41.6%        | 7,235                 | 43.3%        | 1,201               | 7.2%           | 1,325             | 7.9%        | 262            |
| College                        | 18,310                             | 89.2%        | 8,106                     | 39.5%        | 10,204                | 49.7%        | 1,327               | 6.5%           | 897               | 4.4%        | 116            |
| More than college              | 10,513                             | 89.8%        | 4,805                     | 41.1%        | 5,708                 | 48.8%        | 728                 | 6.2%           | 462               | 3.9%        | 59             |
| <b>Race/Hispanic Ethnicity</b> |                                    |              |                           |              |                       |              |                     |                |                   |             |                |
| Hispanic                       | 7,512                              | 75.8%        | 3,455                     | 34.9%        | 4,057                 | 40.9%        | 1,047               | 10.6%          | 1,354             | 13.7%       | 148            |
| White non-Hispanic             | 46,012                             | 86.8%        | 21,436                    | 40.4%        | 24,576                | 46.3%        | 3,697               | 7.0%           | 3,330             | 6.3%        | 430            |
| Black non-Hispanic             | 4,463                              | 76.3%        | 2,102                     | 35.9%        | 2,361                 | 40.4%        | 440                 | 7.5%           | 948               | 16.2%       | 226            |
| Asian                          | 4,259                              | 81.6%        | 1,937                     | 37.1%        | 2,322                 | 44.5%        | 403                 | 7.7%           | 555               | 10.6%       | 34             |
| Other                          | 1,468                              | 80.4%        | 682                       | 37.3%        | 786                   | 43.0%        | 133                 | 7.3%           | 226               | 12.4%       | 41             |
| <b>Birthplace</b>              |                                    |              |                           |              |                       |              |                     |                |                   |             |                |
| U.S. States/D.C.               | 46,442                             | 85.8%        | 21,751                    | 40.2%        | 24,691                | 45.6%        | 3,937               | 7.3%           | 3,769             | 7.0%        | 604            |
| Puerto Rico/U.S. Terr.         | 1,527                              | 77.2%        | 662                       | 33.5%        | 865                   | 43.7%        | 194                 | 9.8%           | 258               | 13.0%       | 39             |
| Non-U.S.-Born                  | 15,774                             | 79.8%        | 7,216                     | 36.5%        | 8,558                 | 43.3%        | 1,591               | 8.1%           | 2,395             | 12.1%       | 284            |
| <b>Parity<sup>3</sup></b>      | <b>Pregnancy-Related Factors</b>   |              |                           |              |                       |              |                     |                |                   |             |                |
| 1                              | 28,182                             | 83.9%        | 12,998                    | 38.7%        | 15,184                | 45.2%        | 2,543               | 7.6%           | 2,853             | 8.5%        | 313            |
| 2-3                            | 31,406                             | 85.0%        | 14,573                    | 39.4%        | 16,833                | 45.5%        | 2,763               | 7.5%           | 2,796             | 7.6%        | 403            |
| 4+                             | 4,073                              | 77.6%        | 2,034                     | 38.8%        | 2,039                 | 38.9%        | 410                 | 7.8%           | 763               | 14.5%       | 102            |
| <b>Smoking<sup>4</sup></b>     |                                    |              |                           |              |                       |              |                     |                |                   |             |                |
| Yes                            | 3,937                              | 72.0%        | 2,028                     | 37.1%        | 1,909                 | 34.9%        | 542                 | 9.9%           | 991               | 18.1%       | 85             |
| No                             | 59,732                             | 85.0%        | 27,572                    | 39.2%        | 32,160                | 45.7%        | 5,165               | 7.3%           | 5,414             | 7.7%        | 787            |
| <b>Plurality</b>               | <b>Birth Outcomes</b>              |              |                           |              |                       |              |                     |                |                   |             |                |
| Singleton                      | 60,476                             | 83.5%        | 26,815                    | 37.0%        | 33,661                | 46.5%        | 5,638               | 7.8%           | 6,282             | 8.7%        | 862            |
| Multiple birth                 | 3,271                              | 93.5%        | 2,817                     | 80.6%        | 454                   | 13.0%        | 84                  | 2.4%           | 142               | 4.1%        | 68             |
| <b>Birthweight</b>             |                                    |              |                           |              |                       |              |                     |                |                   |             |                |
| <500 g                         | 105                                | 91.3%        | 97                        | 84.3%        | 8                     | 7.0%         | 0                   | — <sup>5</sup> | 10                | 8.7%        | 12             |
| 500-1,499 g                    | 845                                | 90.6%        | 766                       | 82.1%        | 79                    | 8.5%         | 13                  | 1.4%           | 75                | 8.0%        | 38             |
| 1,499-2,499 g                  | 4,173                              | 85.8%        | 3,272                     | 67.3%        | 901                   | 18.5%        | 209                 | 4.3%           | 483               | 9.9%        | 110            |
| 2,500-3,999 g                  | 52,335                             | 83.7%        | 23,131                    | 37.0%        | 29,204                | 46.7%        | 4,822               | 7.7%           | 5,400             | 8.6%        | 597            |
| 4,000+ g                       | 6,266                              | 84.7%        | 2,350                     | 31.8%        | 3,916                 | 52.9%        | 678                 | 9.2%           | 452               | 6.1%        | 73             |
| <b>Gestational Age</b>         |                                    |              |                           |              |                       |              |                     |                |                   |             |                |
| <28 weeks                      | 405                                | 88.4%        | 376                       | 82.1%        | 29                    | 6.3%         | 5                   | 1.1%           | 48                | 10.5%       | 32             |
| <37 weeks                      | 5,931                              | 88.2%        | 5,202                     | 77.3%        | 729                   | 10.8%        | 218                 | 3.2%           | 578               | 8.6%        | 198            |
| 37-42 weeks                    | 57,680                             | 83.6%        | 24,372                    | 35.3%        | 33,308                | 48.3%        | 5,480               | 7.9%           | 5,809             | 8.4%        | 606            |

NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.

1. Based on the Adequacy of Prenatal Care Utilization (APNCU) Index. See Glossary and Technical Notes in Appendix for definitions of Index and its categories. 2. Adequate Total is the sum of Adequate Intensive and Adequate Basic. 3. Parity is the number of live births including this birth. 4. Smoking during pregnancy is self-reported by the mother and should be interpreted with caution. 5. Calculations based on fewer than five events are excluded.



**Table 28. Adequacy of Prenatal Care Initiation<sup>1</sup> by Selected Characteristics, Massachusetts: 2005**

|                                | <u>Adequate Total</u> <sup>2</sup> |              | <u>Adequate Intensive</u> |              | <u>Adequate Basic</u> |              | <u>Intermediate</u> |                | <u>Inadequate</u> |             | <u>Unknown</u> |
|--------------------------------|------------------------------------|--------------|---------------------------|--------------|-----------------------|--------------|---------------------|----------------|-------------------|-------------|----------------|
|                                | n                                  | %            | n                         | %            | n                     | %            | n                   | %              | n                 | %           | n              |
| <b>State Total</b>             | <b>69,976</b>                      | <b>92.2%</b> | <b>30,982</b>             | <b>40.8%</b> | <b>38,994</b>         | <b>51.4%</b> | <b>3,700</b>        | <b>4.9%</b>    | <b>2,218</b>      | <b>2.9%</b> | <b>930</b>     |
| <b>Age</b>                     | <b>Maternal Demographics</b>       |              |                           |              |                       |              |                     |                |                   |             |                |
| <18                            | 1,122                              | 76.2%        | 387                       | 26.3%        | 735                   | 49.9%        | 209                 | 14.2%          | 141               | 9.6%        | 27             |
| 18-19                          | 2,541                              | 83.1%        | 918                       | 30.0%        | 1,623                 | 53.1%        | 343                 | 11.2%          | 175               | 5.7%        | 40             |
| 20-24                          | 10,012                             | 86.1%        | 3,986                     | 34.3%        | 6,026                 | 51.8%        | 1,046               | 9.0%           | 573               | 4.9%        | 174            |
| 25-29                          | 16,458                             | 92.5%        | 7,274                     | 40.9%        | 9,184                 | 51.6%        | 811                 | 4.6%           | 520               | 2.9%        | 237            |
| 30-34                          | 22,701                             | 95.0%        | 10,616                    | 44.4%        | 12,085                | 50.6%        | 739                 | 3.1%           | 452               | 1.9%        | 248            |
| 35-39                          | 13,858                             | 95.1%        | 6,308                     | 43.3%        | 7,550                 | 51.8%        | 430                 | 2.9%           | 290               | 2.0%        | 162            |
| 40+                            | 3,281                              | 94.6%        | 1,493                     | 43.0%        | 1,788                 | 51.5%        | 122                 | 3.5%           | 67                | 1.9%        | 41             |
| <b>Educational Attainment</b>  |                                    |              |                           |              |                       |              |                     |                |                   |             |                |
| < than High School             | 6,297                              | 81.1%        | 2,163                     | 27.8%        | 4,134                 | 53.2%        | 963                 | 12.4%          | 509               | 6.6%        | 180            |
| High School                    | 17,064                             | 89.5%        | 7,060                     | 37.0%        | 10,004                | 52.5%        | 1,261               | 6.6%           | 736               | 3.9%        | 251            |
| Some college                   | 15,491                             | 92.7%        | 6,953                     | 41.6%        | 8,538                 | 51.1%        | 755                 | 4.5%           | 460               | 2.8%        | 262            |
| College                        | 19,740                             | 96.1%        | 9,511                     | 46.3%        | 10,229                | 49.8%        | 461                 | 2.2%           | 333               | 1.6%        | 116            |
| More than college              | 11,280                             | 96.4%        | 5,250                     | 44.9%        | 6,030                 | 51.5%        | 254                 | 2.2%           | 169               | 1.4%        | 59             |
| <b>Race/Hispanic Ethnicity</b> |                                    |              |                           |              |                       |              |                     |                |                   |             |                |
| Hispanic                       | 8,646                              | 87.2%        | 3,635                     | 36.7%        | 5,011                 | 50.5%        | 814                 | 8.2%           | 453               | 4.6%        | 148            |
| White non-Hispanic             | 50,017                             | 94.3%        | 22,572                    | 42.6%        | 27,445                | 51.7%        | 1,903               | 3.6%           | 1,119             | 2.1%        | 430            |
| Black non-Hispanic             | 4,963                              | 84.8%        | 2,192                     | 37.5%        | 2,771                 | 47.4%        | 513                 | 8.8%           | 375               | 6.4%        | 226            |
| Asian                          | 4,696                              | 90.0%        | 1,812                     | 34.7%        | 2,884                 | 55.3%        | 350                 | 6.7%           | 171               | 3.3%        | 34             |
| Other                          | 1,618                              | 88.6%        | 752                       | 41.2%        | 866                   | 47.4%        | 114                 | 6.2%           | 95                | 5.2%        | 41             |
| <b>Birthplace</b>              |                                    |              |                           |              |                       |              |                     |                |                   |             |                |
| U.S. States/D.C.               | 50,703                             | 93.6%        | 22,992                    | 42.5%        | 27,711                | 51.2%        | 2,228               | 4.1%           | 1,217             | 2.2%        | 604            |
| Puerto Rico/U.S. Terr.         | 1,747                              | 88.3%        | 690                       | 34.9%        | 1,057                 | 53.4%        | 150                 | 7.6%           | 82                | 4.1%        | 39             |
| Non-U.S.-Born                  | 17,521                             | 88.7%        | 7,299                     | 36.9%        | 10,222                | 51.7%        | 1,321               | 6.7%           | 918               | 4.6%        | 284            |
| <b>Parity</b> <sup>3</sup>     | <b>Pregnancy-Related Factors</b>   |              |                           |              |                       |              |                     |                |                   |             |                |
| 1                              | 30,898                             | 92.0%        | 13,497                    | 40.2%        | 17,401                | 51.8%        | 1,660               | 4.9%           | 1,020             | 3.0%        | 313            |
| 2-3                            | 34,443                             | 93.2%        | 15,548                    | 42.1%        | 18,895                | 51.1%        | 1,594               | 4.3%           | 928               | 2.5%        | 403            |
| 4+                             | 4,541                              | 86.6%        | 1,867                     | 35.6%        | 2,674                 | 51.0%        | 445                 | 8.5%           | 260               | 5.0%        | 102            |
| <b>Smoking</b> <sup>4</sup>    |                                    |              |                           |              |                       |              |                     |                |                   |             |                |
| Yes                            | 4,537                              | 82.9%        | 1,707                     | 31.2%        | 2,830                 | 51.7%        | 565                 | 10.3%          | 368               | 6.7%        | 85             |
| No                             | 65,344                             | 92.9%        | 29,239                    | 41.6%        | 36,105                | 51.4%        | 3,128               | 4.4%           | 1,839             | 2.6%        | 787            |
| <b>Plurality</b>               | <b>Birth Outcomes</b>              |              |                           |              |                       |              |                     |                |                   |             |                |
| Singleton                      | 66,614                             | 92.0%        | 29,405                    | 40.6%        | 37,209                | 51.4%        | 3,583               | 4.9%           | 2,199             | 3.0%        | 862            |
| Multiple birth                 | 3,361                              | 96.1%        | 1,577                     | 45.1%        | 1,784                 | 51.0%        | 117                 | 3.3%           | 19                | 0.5%        | 68             |
| <b>Birthweight</b>             |                                    |              |                           |              |                       |              |                     |                |                   |             |                |
| <500 g                         | 105                                | 91.3%        | 51                        | 44.3%        | 54                    | 47.0%        | 3                   | — <sup>5</sup> | 7                 | 6.1%        | 12             |
| 500-1,499 g                    | 865                                | 92.7%        | 470                       | 50.4%        | 395                   | 42.3%        | 39                  | 4.2%           | 29                | 3.1%        | 38             |
| 1,499-2,499 g                  | 4,417                              | 90.8%        | 1,963                     | 40.3%        | 2,454                 | 50.4%        | 284                 | 5.8%           | 164               | 3.4%        | 110            |
| 2,500-3,999 g                  | 57,579                             | 92.0%        | 25,357                    | 40.5%        | 32,222                | 51.5%        | 3,107               | 5.0%           | 1,871             | 3.0%        | 597            |
| 4,000+ g                       | 6,986                              | 94.5%        | 3,132                     | 42.3%        | 3,854                 | 52.1%        | 266                 | 3.6%           | 144               | 1.9%        | 73             |
| <b>Gestational Age</b>         |                                    |              |                           |              |                       |              |                     |                |                   |             |                |
| <28 weeks                      | 414                                | 90.4%        | 218                       | 47.6%        | 196                   | 42.8%        | 24                  | 5.2%           | 20                | 4.4%        | 32             |
| <37 weeks                      | 6,187                              | 92.0%        | 2,984                     | 44.4%        | 3,203                 | 47.6%        | 343                 | 5.1%           | 197               | 2.9%        | 198            |
| 37-42 weeks                    | 63,626                             | 92.3%        | 27,948                    | 40.5%        | 35,678                | 51.7%        | 3,343               | 4.8%           | 2,000             | 2.9%        | 606            |

NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.

1. Based on the Adequacy of Initiation Index, a component index of the APNCU Index. See Glossary and Technical Notes in Appendix for definitions of Index and its categories. 2. Adequate Total is the sum of Adequate Intensive and Adequate Basic. 3. Parity is the number of live births including this birth.

4. Smoking during pregnancy is self-reported by the mother and should be interpreted with caution. 5. Calculations based on fewer than five events are excluded.

**Table 29. Adequacy of Prenatal Care Visits<sup>1</sup> by Selected Characteristics, Massachusetts: 2005**

|                                | <u>Adequate Total</u> <sup>2</sup>      |              | <u>Adequate Intensive</u> |              | <u>Adequate Basic</u> |              | <u>Intermediate</u> |             | <u>Inadequate</u> |             | <u>Unknown</u> |
|--------------------------------|---|--------------|---------------------------|--------------|-----------------------|--------------|---------------------|-------------|-------------------|-------------|----------------|
|                                | n                                       | %            | n                         | %            | n                     | %            | n                   | %           | n                 | %           | n              |
| <b>State Total</b>             | <b>68,717</b>                           | <b>90.5%</b> | <b>33,478</b>             | <b>44.1%</b> | <b>35,239</b>         | <b>46.4%</b> | <b>6,293</b>        | <b>8.3%</b> | <b>884</b>        | <b>1.2%</b> | <b>930</b>     |
| <b>Age</b>                     | <b><u>Maternal Demographics</u></b>     |              |                           |              |                       |              |                     |             |                   |             |                |
| <18                            | 1,258                                   | 85.5%        | 669                       | 45.4%        | 589                   | 40.0%        | 175                 | 11.9%       | 39                | 2.6%        | 27             |
| 18-19                          | 2,609                                   | 85.3%        | 1,307                     | 42.7%        | 1,302                 | 42.6%        | 383                 | 12.5%       | 67                | 2.2%        | 40             |
| 20-24                          | 10,187                                  | 87.6%        | 5,055                     | 43.5%        | 5,132                 | 44.1%        | 1,222               | 10.5%       | 222               | 1.9%        | 174            |
| 25-29                          | 16,022                                  | 90.1%        | 7,717                     | 43.4%        | 8,305                 | 46.7%        | 1,558               | 8.8%        | 209               | 1.2%        | 237            |
| 30-34                          | 21,953                                  | 91.9%        | 10,241                    | 42.9%        | 11,712                | 49.0%        | 1,744               | 7.3%        | 195               | 0.8%        | 248            |
| 35-39                          | 13,479                                  | 92.5%        | 6,748                     | 46.3%        | 6,731                 | 46.2%        | 986                 | 6.8%        | 113               | 0.8%        | 162            |
| 40+                            | 3,207                                   | 92.4%        | 1,740                     | 50.1%        | 1,467                 | 42.3%        | 224                 | 6.5%        | 39                | 1.1%        | 41             |
| <b>Educational Attainment</b>  |   |              |                           |              |                       |              |                     |             |                   |             |                |
| < than High School             | 6,570                                   | 84.6%        | 3,537                     | 45.5%        | 3,033                 | 39.0%        | 979                 | 12.6%       | 220               | 2.8%        | 180            |
| High School                    | 16,908                                  | 88.7%        | 8,327                     | 43.7%        | 8,581                 | 45.0%        | 1,856               | 9.7%        | 297               | 1.6%        | 251            |
| Some college                   | 15,231                                  | 91.2%        | 7,788                     | 46.6%        | 7,443                 | 44.6%        | 1,292               | 7.7%        | 183               | 1.1%        | 262            |
| College                        | 19,019                                  | 92.6%        | 8,677                     | 42.3%        | 10,342                | 50.4%        | 1,387               | 6.8%        | 128               | 0.6%        | 116            |
| More than college              | 10,897                                  | 93.1%        | 5,109                     | 43.7%        | 5,788                 | 49.5%        | 758                 | 6.5%        | 48                | 0.4%        | 59             |
| <b>Race/Hispanic Ethnicity</b> |   |              |                           |              |                       |              |                     |             |                   |             |                |
| Hispanic                       | 8,573                                   | 86.5%        | 4,248                     | 42.9%        | 4,325                 | 43.6%        | 1,178               | 11.9%       | 162               | 1.6%        | 148            |
| White non-Hispanic             | 48,576                                  | 91.6%        | 23,454                    | 44.2%        | 25,122                | 47.4%        | 3,963               | 7.5%        | 500               | 0.9%        | 430            |
| Black non-Hispanic             | 5,185                                   | 88.6%        | 2,661                     | 45.5%        | 2,524                 | 43.1%        | 539                 | 9.2%        | 127               | 2.2%        | 226            |
| Asian                          | 4,706                                   | 90.2%        | 2,278                     | 43.7%        | 2,428                 | 46.5%        | 453                 | 8.7%        | 58                | 1.1%        | 34             |
| Other                          | 1,636                                   | 89.5%        | 810                       | 44.3%        | 826                   | 45.2%        | 157                 | 8.6%        | 34                | 1.9%        | 41             |
| <b>Birthplace</b>              |   |              |                           |              |                       |              |                     |             |                   |             |                |
| U.S. States/D.C.               | 49,266                                  | 91.0%        | 23,960                    | 44.2%        | 25,306                | 46.7%        | 4,286               | 7.9%        | 596               | 1.1%        | 604            |
| Puerto Rico/U.S. Terr.         | 1,716                                   | 86.7%        | 792                       | 40.0%        | 924                   | 46.7%        | 220                 | 11.1%       | 43                | 2.2%        | 39             |
| Non-U.S.-Born                  | 17,728                                  | 89.7%        | 8,720                     | 44.1%        | 9,008                 | 45.6%        | 1,787               | 9.0%        | 245               | 1.2%        | 284            |
| <b>Parity</b> <sup>3</sup>     | <b><u>Pregnancy-Related Factors</u></b> |              |                           |              |                       |              |                     |             |                   |             |                |
| 1                              | 30,485                                  | 90.8%        | 14,796                    | 44.1%        | 15,689                | 46.7%        | 2,766               | 8.2%        | 327               | 1.0%        | 313            |
| 2-3                            | 33,538                                  | 90.7%        | 16,211                    | 43.9%        | 17,327                | 46.9%        | 3,013               | 8.2%        | 414               | 1.1%        | 403            |
| 4+                             | 4,600                                   | 87.7%        | 2,439                     | 46.5%        | 2,161                 | 41.2%        | 508                 | 9.7%        | 138               | 2.6%        | 102            |
| <b>Smoking</b> <sup>4</sup>    |   |              |                           |              |                       |              |                     |             |                   |             |                |
| Yes                            | 4,644                                   | 84.9%        | 2,582                     | 47.2%        | 2,062                 | 37.7%        | 647                 | 11.8%       | 179               | 3.3%        | 85             |
| No                             | 63,985                                  | 91.0%        | 30,857                    | 43.9%        | 33,128                | 47.1%        | 5,629               | 8.0%        | 697               | 1.0%        | 787            |
| <b>Plurality</b>               | <b><u>Birth Outcomes</u></b>            |              |                           |              |                       |              |                     |             |                   |             |                |
| Singleton                      | 65,324                                  | 90.2%        | 30,555                    | 42.2%        | 34,769                | 48.0%        | 6,199               | 8.6%        | 873               | 1.2%        | 862            |
| Multiple birth                 | 3,392                                   | 97.0%        | 2,922                     | 83.6%        | 470                   | 13.4%        | 94                  | 2.7%        | 11                | 0.3%        | 68             |
| <b>Birthweight</b>             |   |              |                           |              |                       |              |                     |             |                   |             |                |
| <500 g                         | 108                                     | 93.9%        | 98                        | 85.2%        | 10                    | 8.7%         | 0                   | 0.0%        | 7                 | 6.1%        | 12             |
| 500-1,499 g                    | 885                                     | 94.9%        | 799                       | 85.6%        | 86                    | 9.2%         | 15                  | 1.6%        | 33                | 3.5%        | 38             |
| 1,499-2,499 g                  | 4,525                                   | 93.0%        | 3,566                     | 73.3%        | 959                   | 19.7%        | 241                 | 5.0%        | 99                | 2.0%        | 110            |
| 2,500-3,999 g                  | 56,549                                  | 90.4%        | 26,372                    | 42.2%        | 30,177                | 48.2%        | 5,320               | 8.5%        | 688               | 1.1%        | 597            |
| 4,000+ g                       | 6,625                                   | 89.6%        | 2,626                     | 35.5%        | 3,999                 | 54.1%        | 717                 | 9.7%        | 54                | 0.7%        | 73             |
| <b>Gestational Age</b>         |   |              |                           |              |                       |              |                     |             |                   |             |                |
| <28 weeks                      | 429                                     | 93.7%        | 394                       | 86.0%        | 35                    | 7.6%         | 5                   | 1.1%        | 24                | 5.2%        | 32             |
| <37 weeks                      | 6,332                                   | 94.1%        | 5,548                     | 82.5%        | 784                   | 11.7%        | 259                 | 3.9%        | 136               | 2.0%        | 198            |
| 37-42 weeks                    | 62,233                                  | 90.2%        | 27,859                    | 40.4%        | 34,374                | 49.8%        | 6,007               | 8.7%        | 729               | 1.1%        | 606            |

NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.

1. Based on the Adequacy of Received Services (Visits) Index, a component index of the APNCU Index. See Glossary and Technical Notes in Appendix for definitions of Index and its categories. 2. Adequate Total is the sum of Adequate Intensive and Adequate Basic. 3. Parity is the number of live births including this birth. 4. Smoking during pregnancy is self-reported by the mother and should be interpreted with caution.

**Table 30. Birth Characteristics by Race/Hispanic Ethnicity and Source of Prenatal Care Payment (Public/Private) -- Massachusetts: 2005**

| Race/Ethnicity and Payment Source | Births <sup>1</sup> |              | Teen Births  |                 |              |             | Birthweight           |                 |                  |             |
|-----------------------------------|---------------------|--------------|--------------|-----------------|--------------|-------------|-----------------------|-----------------|------------------|-------------|
|                                   | n                   | %            | <18 Years    |                 | <20 Years    |             | Very Low <sup>2</sup> |                 | Low <sup>3</sup> |             |
|                                   | n                   | %            | n            | %               | n            | %           | n                     | %               | N                | %           |
| <b>STATE TOTAL<sup>4</sup></b>    | <b>76,824</b>       | <b>100.0</b> | <b>1,499</b> | <b>2.0</b>      | <b>4,598</b> | <b>6.0</b>  | <b>1,098</b>          | <b>1.4</b>      | <b>6,073</b>     | <b>7.9</b>  |
| Public                            | 24,499              | 32.6         | 1,117        | 4.6             | 3,485        | 14.2        | 366                   | 1.5             | 2,070            | 8.4         |
| Medicaid <sup>5</sup>             | 18,200              | 24.2         | 864          | 4.7             | 2,705        | 14.9        | 276                   | 1.5             | 1,576            | 8.7         |
| Other Public <sup>6</sup>         | 6,299               | 8.4          | 253          | 4.0             | 780          | 12.4        | 90                    | 1.4             | 494              | 7.8         |
| Private <sup>7</sup>              | 50,000              | 66.5         | 330          | 0.7             | 985          | 2.0         | 628                   | 1.3             | 3,659            | 7.3         |
| <b>White non-Hispanic</b>         | <b>53,469</b>       | <b>100.0</b> | <b>546</b>   | <b>1.0</b>      | <b>2,081</b> | <b>3.9</b>  | <b>653</b>            | <b>1.2</b>      | <b>3,896</b>     | <b>7.3</b>  |
| Public                            | 11,219              | 21.5         | 334          | 3.0             | 1,415        | 12.6        | 132                   | 1.2             | 884              | 7.9         |
| Medicaid <sup>5</sup>             | 8,846               | 17.0         | 289          | 3.3             | 1,183        | 13.4        | 109                   | 1.2             | 712              | 8.0         |
| Other Public <sup>6</sup>         | 2,373               | 4.6          | 45           | 1.9             | 232          | 9.8         | 23                    | 1.0             | 172              | 7.2         |
| Private <sup>7</sup>              | 40,453              | 77.6         | 190          | 0.5             | 601          | 1.5         | 455                   | 1.1             | 2,771            | 6.8         |
| <b>Black non-Hispanic</b>         | <b>6,077</b>        | <b>100.0</b> | <b>207</b>   | <b>3.4</b>      | <b>604</b>   | <b>9.9</b>  | <b>177</b>            | <b>2.9</b>      | <b>731</b>       | <b>12.0</b> |
| Public                            | 3,708               | 61.9         | 161          | 4.3             | 463          | 12.5        | 88                    | 2.4             | 414              | 11.2        |
| Medicaid <sup>5</sup>             | 2,817               | 47.0         | 133          | 4.7             | 389          | 13.8        | 68                    | 2.4             | 319              | 11.3        |
| Other Public <sup>6</sup>         | 891                 | 14.9         | 28           | 3.1             | 74           | 8.3         | 20                    | 2.2             | 95               | 10.7        |
| Private <sup>7</sup>              | 2,242               | 37.4         | 36           | 1.6             | 124          | 5.5         | 81                    | 3.6             | 289              | 12.9        |
| <b>Hispanic</b>                   | <b>10,061</b>       | <b>100.0</b> | <b>608</b>   | <b>6.0</b>      | <b>1,551</b> | <b>15.4</b> | <b>160</b>            | <b>1.6</b>      | <b>828</b>       | <b>8.2</b>  |
| Public                            | 7,221               | 72.3         | 523          | 7.2             | 1,342        | 18.6        | 112                   | 1.6             | 568              | 7.9         |
| Medicaid <sup>5</sup>             | 4,702               | 47.1         | 353          | 7.5             | 899          | 19.1        | 67                    | 1.4             | 381              | 8.1         |
| Other Public <sup>6</sup>         | 2,519               | 25.2         | 170          | 6.7             | 443          | 17.6        | 45                    | 1.8             | 187              | 7.4         |
| Private <sup>7</sup>              | 2,693               | 27.0         | 74           | 2.7             | 183          | 6.8         | 37                    | 1.4             | 235              | 8.7         |
| <b>Asian</b>                      | <b>5,251</b>        | <b>100.0</b> | <b>66</b>    | <b>1.3</b>      | <b>163</b>   | <b>3.1</b>  | <b>47</b>             | <b>0.9</b>      | <b>409</b>       | <b>7.8</b>  |
| Public                            | 1,312               | 25.1         | 49           | 3.7             | 125          | 9.5         | 14                    | 1.1             | 103              | 7.9         |
| Medicaid <sup>5</sup>             | 1,024               | 19.6         | 46           | 4.5             | 113          | 11.0        | 13                    | 1.3             | 80               | 7.8         |
| Other Public <sup>6</sup>         | 288                 | 5.5          | 3            | -- <sup>8</sup> | 12           | 4.2         | 1                     | -- <sup>8</sup> | 23               | 8.0         |
| Private <sup>7</sup>              | 3,874               | 74.0         | 16           | 0.4             | 34           | 0.9         | 31                    | 0.8             | 294              | 7.6         |
| <b>Other<sup>9</sup></b>          | <b>1,868</b>        | <b>100.0</b> | <b>69</b>    | <b>3.7</b>      | <b>192</b>   | <b>10.3</b> | <b>58</b>             | <b>3.1</b>      | <b>203</b>       | <b>10.9</b> |
| Public                            | 1,018               | 57.5         | 48           | 4.7             | 135          | 13.3        | 20                    | 2.0             | 100              | 9.8         |
| Medicaid <sup>5</sup>             | 793                 | 44.8         | 41           | 5.2             | 116          | 14.6        | 19                    | 2.4             | 84               | 10.6        |
| Other Public <sup>6</sup>         | 225                 | 12.7         | 7            | 3.1             | 19           | 8.4         | 1                     | -- <sup>8</sup> | 16               | 7.1         |
| Private <sup>7</sup>              | 720                 | 40.7         | 14           | 1.9             | 43           | 6.0         | 24                    | 3.3             | 69               | 9.6         |

**Table 30 (cont.) Birth Characteristics by Race/Hispanic Ethnicity and Source of Prenatal Care Payment (Public/Private) -- Massachusetts: 2005**

| Race/Ethnicity and Payment Source | Prenatal Care          |             |                     |             |                  |             |                             |             |
|-----------------------------------|------------------------|-------------|---------------------|-------------|------------------|-------------|-----------------------------|-------------|
|                                   | Adequate <sup>10</sup> |             | Began 1st Trimester |             | Cesarean Section |             | Breastfeeding <sup>11</sup> |             |
|                                   | n                      | %           | n                   | %           | n                | %           | n                           | %           |
| <b>STATE TOTAL<sup>4</sup></b>    | <b>63,748</b>          | <b>84.0</b> | <b>63,410</b>       | <b>83.2</b> | <b>24,732</b>    | <b>32.3</b> | <b>59,845</b>               | <b>79.3</b> |
| Public                            | 17,946                 | 74.5        | 17,351              | 71.6        | 6,749            | 27.6        | 17,395                      | 71.2        |
| Medicaid <sup>5</sup>             | 13,510                 | 75.2        | 13,118              | 72.8        | 5,076            | 27.9        | 12,612                      | 69.4        |
| Other Public <sup>6</sup>         | 4,436                  | 72.2        | 4,233               | 68.2        | 1,673            | 26.8        | 4,783                       | 76.6        |
| Private <sup>7</sup>              | 44,375                 | 89.2        | 44,565              | 89.4        | 17,329           | 34.7        | 41,686                      | 83.5        |
| <b>White non-Hispanic</b>         | <b>46,012</b>          | <b>86.8</b> | <b>46,129</b>       | <b>86.7</b> | <b>17,861</b>    | <b>33.5</b> | <b>40,890</b>               | <b>78.1</b> |
| Public                            | 8,588                  | 77.1        | 8,263               | 74.0        | 3,226            | 28.8        | 7,159                       | 64.0        |
| Medicaid <sup>5</sup>             | 6,743                  | 76.7        | 6,527               | 74.1        | 2,546            | 28.8        | 5,375                       | 60.8        |
| Other Public <sup>6</sup>         | 1,845                  | 78.6        | 1,736               | 73.6        | 680              | 28.8        | 1,784                       | 75.6        |
| Private <sup>7</sup>              | 36,188                 | 89.8        | 36,567              | 90.6        | 14,092           | 34.9        | 33,191                      | 82.2        |
| <b>Black non-Hispanic</b>         | <b>4,463</b>           | <b>76.3</b> | <b>4,258</b>        | <b>72.0</b> | <b>2,037</b>     | <b>33.7</b> | <b>4,851</b>                | <b>80.5</b> |
| Public                            | 2,507                  | 70.9        | 2,381               | 66.4        | 1,172            | 31.8        | 2,805                       | 76.0        |
| Medicaid <sup>5</sup>             | 1,987                  | 73.3        | 1,893               | 69.2        | 887              | 31.6        | 2,134                       | 75.9        |
| Other Public <sup>6</sup>         | 520                    | 63.1        | 488                 | 57.5        | 285              | 32.4        | 671                         | 76.3        |
| Private <sup>7</sup>              | 1,921                  | 87.3        | 1,839               | 83.0        | 838              | 37.5        | 1,987                       | 88.7        |
| <b>Hispanic</b>                   | <b>7,512</b>           | <b>75.8</b> | <b>7,428</b>        | <b>74.5</b> | <b>2,713</b>     | <b>27.1</b> | <b>8,088</b>                | <b>80.8</b> |
| Public                            | 5,137                  | 72.3        | 5,132               | 71.8        | 1,759            | 24.4        | 5,654                       | 78.6        |
| Medicaid <sup>5</sup>             | 3,414                  | 73.6        | 3,456               | 74.2        | 1,187            | 25.3        | 3,740                       | 79.6        |
| Other Public <sup>6</sup>         | 1,723                  | 69.8        | 1,676               | 67.2        | 572              | 22.9        | 1,914                       | 76.7        |
| Private <sup>7</sup>              | 2,329                  | 87.2        | 2,243               | 83.7        | 929              | 34.5        | 2,348                       | 87.3        |
| <b>Asian</b>                      | <b>4,259</b>           | <b>81.6</b> | <b>4,116</b>        | <b>78.7</b> | <b>1,515</b>     | <b>28.9</b> | <b>4,447</b>                | <b>84.9</b> |
| Public                            | 925                    | 71.4        | 807                 | 62.0        | 271              | 20.7        | 898                         | 68.6        |
| Medicaid <sup>5</sup>             | 733                    | 72.3        | 627                 | 61.7        | 210              | 20.5        | 683                         | 66.9        |
| Other Public <sup>6</sup>         | 192                    | 68.1        | 180                 | 63.2        | 61               | 21.2        | 215                         | 74.7        |
| Private <sup>7</sup>              | 3,298                  | 85.4        | 3,280               | 84.8        | 1,227            | 31.7        | 3,505                       | 90.5        |
| <b>Other<sup>9</sup></b>          | <b>1,468</b>           | <b>80.4</b> | <b>1,446</b>        | <b>78.5</b> | <b>586</b>       | <b>31.6</b> | <b>1,544</b>                | <b>86.7</b> |
| Public                            | 776                    | 77.3        | 754                 | 74.7        | 314              | 31.0        | 870                         | 85.6        |
| Medicaid <sup>5</sup>             | 622                    | 79.3        | 603                 | 76.6        | 241              | 30.5        | 672                         | 84.8        |
| Other Public <sup>6</sup>         | 154                    | 70.0        | 151                 | 68.0        | 73               | 32.7        | 198                         | 88.4        |
| Private <sup>7</sup>              | 623                    | 87.5        | 620                 | 87.0        | 235              | 32.9        | 640                         | 89.0        |

NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.

1. In the "Births" column, percentages are based on race/ethnicity category totals (in column). For all other characteristics, percentages are based on the total number of births for the race/ethnicity by payment source for the row. 2. Very low birthweight: less than 1,500 grams or 3.3 pounds. 3. Low Birthweight: less than 2,500 grams or 5.5 pounds. 4. Total births do not equal Public + Private because Workers' Compensation, self-paid, and other are in the state total but not shown in the table. 5. Medicaid/MassHealth. 6. Other Public: Commonwealth, Healthy Start, Medicare, other government programs, and free care. 7. Private: commercial indemnity plans or commercial managed care organizations (HMO, PPO, IPP, or IPA). 8. Calculations based on fewer than five events are excluded. 9. Other: Mothers who designated their race as American Indian or "Other." 10. Based on the Adequacy of Prenatal Care Utilization (APNCU) Index. 11. Mother was breastfeeding or intending to breastfeed at the time the birth certificate was completed.

**Table 31. Cesarean Section Deliveries and Vaginal Births after Cesarean Section (VBACs) by Licensed Maternity Facility<sup>1</sup>, All Births, Massachusetts: 2005**

| Facility   | Occurrence Births <sup>2</sup> | Total         |                  | Primary C-Section <sup>2</sup> |                  | Repeat       |                  | C-Sections VBACs <sup>2</sup> |                 |
|--|--------------------------------|---------------|------------------|--------------------------------|------------------|--------------|------------------|-------------------------------|-----------------|
|  |                                | N             | % <sup>3,4</sup> | N                              | % <sup>3,5</sup> | N            | % <sup>3,6</sup> | N                             | % <sup>7</sup>  |
| <b>State Total</b>                               | <b>77,841</b>                  | <b>25,189</b> | <b>32.5</b>      | <b>15,802</b>                  | <b>23.5</b>      | <b>9,387</b> | <b>90.5</b>      | <b>981</b>                    | <b>9.5</b>      |
| Anna Jaques Hospital                             | 710                            | 236           | 33.2             | 151                            | 24.8             | 85           | 85.0             | 15                            | 15.0            |
| Baystate Medical Center                          | 4,112                          | 1,203         | 30.2             | 742                            | 21.6             | 461          | 84.4             | 85                            | 15.6            |
| Berkshire Medical Center                         | 771                            | 234           | 30.4             | 162                            | 23.7             | 72           | 82.8             | 15                            | 17.2            |
| Beth Israel Deaconess Medical Center             | 4,873                          | 2,067         | 42.4             | 1,416                          | 34.2             | 651          | 89.4             | 77                            | 10.6            |
| Beverly Hospital                                 | 2,068                          | 693           | 33.5             | 430                            | 24.3             | 263          | 87.7             | 37                            | 12.3            |
| Boston Medical Center                            | 2,290                          | 689           | 30.1             | 454                            | 22.2             | 235          | 95.5             | 11                            | 4.5             |
| Brigham and Women's Hospital                     | 8,382                          | 2,737         | 32.8             | 1,747                          | 24.3             | 990          | 84.8             | 177                           | 15.2            |
| Brockton Hospital                                | 1,378                          | 479           | 34.8             | 313                            | 26.1             | 166          | 91.7             | 15                            | 8.3             |
| Cambridge Hospital                               | 1,180                          | 334           | 28.3             | 202                            | 19.8             | 132          | 82.5             | 28                            | 17.5            |
| Cape Cod Hospital                                | 1,009                          | 278           | 27.6             | 143                            | 16.7             | 135          | 87.1             | 20                            | 12.9            |
| Caritas Good Samaritan Medical Center            | 958                            | 368           | 38.4             | 216                            | 27.0             | 152          | 95.6             | 7                             | 4.4             |
| Caritas Holy Family Hospital and Medical Center  | 1,323                          | 545           | 41.2             | 348                            | 30.9             | 197          | 99.5             | 1                             | -- <sup>8</sup> |
| Caritas Norwood Hospital                         | 557                            | 202           | 36.3             | 125                            | 26.5             | 77           | 90.6             | 8                             | 9.4             |
| Caritas St. Elizabeth's Medical Center of Boston | 1,345                          | 505           | 37.6             | 316                            | 27.6             | 189          | 95.0             | 10                            | 5.0             |
| Charlton Memorial Hospital                       | 1,647                          | 556           | 33.8             | 342                            | 23.9             | 214          | 99.1             | 2                             | -- <sup>8</sup> |
| Cooley Dickinson Hospital                        | 830                            | 211           | 25.4             | 137                            | 18.5             | 74           | 81.3             | 17                            | 18.7            |
| Emerson Hospital                                 | 1,168                          | 427           | 36.6             | 255                            | 26.0             | 172          | 91.0             | 17                            | 9.0             |
| Fairview Hospital                                | 160                            | 50            | 31.3             | 22                             | 16.7             | 28           | 100.0            | 0                             | -- <sup>8</sup> |
| Falmouth Hospital                                | 637                            | 204           | 32.3             | 110                            | 20.4             | 94           | 100.0            | 0                             | -- <sup>8</sup> |
| Franklin Medical Center                          | 458                            | 126           | 27.5             | 74                             | 18.7             | 52           | 83.9             | 10                            | 16.1            |
| Harrington Memorial Hospital                     | 424                            | 129           | 30.6             | 74                             | 20.4             | 55           | 94.8             | 3                             | -- <sup>8</sup> |
| Heywood Memorial Hospital                        | 565                            | 122           | 21.6             | 61                             | 12.4             | 61           | 84.7             | 11                            | 15.3            |
| Holyoke Hospital                                 | 620                            | 126           | 20.3             | 66                             | 11.9             | 60           | 89.6             | 7                             | 10.4            |
| Jordan Hospital                                  | 620                            | 214           | 34.5             | 142                            | 26.2             | 72           | 92.3             | 6                             | 7.7             |
| Lawrence General Hospital                        | 1,739                          | 508           | 29.2             | 254                            | 17.3             | 254          | 93.0             | 19                            | 7.0             |
| Leominster Hospital                              | 1,153                          | 276           | 24.1             | 143                            | 14.2             | 133          | 95.0             | 7                             | 5.0             |
| Lowell General Hospital                          | 1,850                          | 584           | 31.6             | 365                            | 22.6             | 219          | 92.0             | 19                            | 8.0             |
| Martha's Vineyard Hospital                       | 152                            | 36            | 23.7             | 26                             | 18.3             | 10           | 100.0            | 0                             | 0.0             |
| Mary Lane Hospital                               | 188                            | 67            | 35.6             | 36                             | 22.9             | 31           | 100.0            | 0                             | 0.0             |
| Massachusetts General Hospital                   | 3,500                          | 1,115         | 31.9             | 734                            | 24.0             | 381          | 86.4             | 60                            | 13.6            |
| Melrose-Wakefield Hospital                       | 1,267                          | 520           | 41.0             | 313                            | 29.6             | 207          | 99.5             | 1                             | -- <sup>8</sup> |
| Mercy Medical Center                             | 1,416                          | 317           | 22.6             | 176                            | 14.2             | 141          | 86.5             | 22                            | 13.5            |

**Table 31 (cont.). Cesarean Section Deliveries and Vaginal Births after Cesarean Section (VBACs) by Licensed Maternity Facility<sup>1</sup>, All Births, Massachusetts: 2005**

| Facility   | Occurrence Births <sup>2</sup> | Total |                  | Primary C-Section <sup>2</sup> |                  | Repeat |                  | C-Sections VBACs <sup>2</sup> |                 |
|--|--------------------------------|-------|------------------|--------------------------------|------------------|--------|------------------|-------------------------------|-----------------|
|  |                                | N     | % <sup>3,4</sup> | N                              | % <sup>3,5</sup> | N      | % <sup>3,6</sup> | N                             | % <sup>7</sup>  |
| Metrowest Medical Center-Framingham Union Campus | 2,018                          | 734   | 36.4             | 465                            | 26.6             | 269    | 99.6             | 1                             | -- <sup>8</sup> |
| Milford Regional Medical Center                  | 915                            | 323   | 35.4             | 195                            | 24.9             | 128    | 97.7             | 3                             | -- <sup>8</sup> |
| Morton Hospital                                  | 469                            | 177   | 38.1             | 106                            | 27.2             | 71     | 93.4             | 5                             | 6.6             |
| Mount Auburn Hospital                            | 1,812                          | 441   | 24.4             | 290                            | 17.9             | 151    | 78.6             | 41                            | 21.4            |
| Nantucket Cottage Hospital                       | 111                            | 31    | 27.9             | 20                             | 20.2             | 11     | 91.7             | 1                             | -- <sup>8</sup> |
| Newton Wellesley Hospital                        | 3,182                          | 1,191 | 37.4             | 736                            | 27.2             | 455    | 95.6             | 21                            | 4.4             |
| North Adams Regional Hospital                    | 294                            | 78    | 26.5             | 36                             | 14.3             | 42     | 97.7             | 1                             | -- <sup>8</sup> |
| North Shore Medical Center - Salem Hospital      | 1,914                          | 609   | 31.8             | 380                            | 22.8             | 229    | 93.5             | 16                            | 6.5             |
| Saint Vincent Hospital                           | 1,760                          | 481   | 27.3             | 289                            | 19.0             | 192    | 79.3             | 50                            | 20.7            |
| Saints Memorial Medical Center                   | 684                            | 237   | 34.7             | 150                            | 25.3             | 87     | 96.7             | 3                             | -- <sup>8</sup> |
| South Shore Hospital                             | 3,790                          | 1,420 | 37.5             | 902                            | 27.9             | 518    | 93.2             | 38                            | 6.8             |
| St. Luke's Hospital                              | 1,605                          | 456   | 28.5             | 240                            | 17.4             | 216    | 97.7             | 5                             | 2.3             |
| Sturdy Memorial Hospital                         | 1,076                          | 392   | 36.4             | 239                            | 26.1             | 153    | 96.2             | 6                             | 3.8             |
| Tobey Hospital                                   | 496                            | 89    | 18.1             | 54                             | 12.1             | 35     | 79.5             | 9                             | 20.5            |
| Tufts-New England Medical Center Hospital        | 1,244                          | 472   | 37.9             | 316                            | 29.4             | 156    | 91.8             | 14                            | 8.2             |
| UMASS Memorial Medical Center - West Campus      | 4,462                          | 1,223 | 27.4             | 919                            | 22.3             | 304    | 88.9             | 38                            | 11.1            |
| Winchester Hospital                              | 2,079                          | 674   | 32.6             | 367                            | 21.0             | 307    | 95.9             | 13                            | 4.1             |

NOTES: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.

1. A licensed maternity facility is a medical unit licensed by the Commonwealth for the care of women during pregnancy and childbirth. 2. See Glossary for definitions of occurrence births, primary and repeat Cesarean sections, and VBACs. The percentages provided in this table are based on occurrence births, and may differ from data which are based on resident births, presented elsewhere in this book. 3. The percentage of Cesarean births reported is not adjusted for risk factors such as mother's age, birthweight, or complications of labor and delivery, which would influence the number of procedures in a particular facility. Caution should be used when comparing unadjusted percentages. 4. Percentage of total Cesarean sections= (total Cesarean births/all births) x 100. 5. Percentage primary Cesarean sections= (primary Cesarean sections/all births-repeat Cesarean sections-VBACs) x 100. 6. Percentage repeat Cesarean sections= (repeat Cesarean sections/ (repeat Cesarean sections + VBACs)) x100. 7. Percentage VBACs= (VBAC deliveries/ (repeat Cesarean sections + VBAC)) x 100. 8. Calculations based on fewer than five events are excluded.

**Table 32. Cesarean Section Deliveries for Singleton Births by Licensed Maternity Facility and Number of Previous Births, Massachusetts: 2005**

| Facility <sup>1</sup>                                | <u>First Birth</u>  |                |                | <u>Second or Later Birth<br/>without prior C-section</u> |                |                 | <u>Second or Later Birth<br/>with prior C-section</u> |                |                |
|--|---------------------|----------------|----------------|--|----------------|-----------------|---|----------------|----------------|
|  | Births <sup>2</sup> | C-section<br>n | % <sup>3</sup> | Births <sup>2</sup>                                      | C-section<br>n | % <sup>3</sup>  | Births <sup>2</sup>                                   | C-section<br>n | % <sup>3</sup> |
| <b>State Total</b>                                   | <b>33,272</b>       | <b>10,494</b>  | <b>31.5</b>    | <b>30,729</b>  | <b>3,126</b>   | <b>10.2</b>     | <b>9,773</b>  | <b>8,815</b>   | <b>90.2</b>    |
| Anna Jaques Hospital                                 | 313                 | 106            | 33.9           | 274  | 25             | 9.1             | 95  | 80             | 84.2           |
| Baystate Medical Center                              | 1,542               | 429            | 27.8           | 1,650  | 160            | 9.7             | 518   | 435            | 84.0           |
| Berkshire Medical Center                             | 309                 | 115            | 37.2           | 350  | 27             | 7.7             | 85  | 70             | 82.4           |
| Beth Israel Deaconess<br>Medical Center              | 2,204               | 913            | 41.4           | 1,596  | 221            | 13.8            | 681   | 607            | 89.1           |
| Beverly Hospital                                     | 818                 | 289            | 35.3           | 856  | 74             | 8.6             | 286   | 249            | 87.1           |
| Boston Medical Center                                | 943                 | 255            | 27.0           | 1,037  | 156            | 15.0            | 242   | 231            | 95.5           |
| Brigham and Women's<br>Hospital                      | 3,537               | 998            | 28.2           | 3,009  | 291            | 9.7             | 980   | 817            | 83.4           |
| Brockton Hospital                                    | 617                 | 222            | 36.0           | 548  | 67             | 12.2            | 175   | 160            | 91.4           |
| Cambridge Hospital                                   | 663                 | 168            | 25.3           | 349  | 27             | 7.7             | 156   | 128            | 82.1           |
| Cape Cod Hospital                                    | 443                 | 107            | 24.2           | 387  | 18             | 4.7             | 148   | 128            | 86.5           |
| Caritas Good Samaritan<br>Medical Center             | 369                 | 145            | 39.3           | 409  | 58             | 14.2            | 153   | 146            | 95.4           |
| Caritas Holy Family Hospital<br>and Medical Center   | 589                 | 271            | 46.0           | 500  | 51             | 10.2            | 186   | 185            | 99.5           |
| Caritas Norwood Hospital                             | 241                 | 94             | 39.0           | 225  | 29             | 12.9            | 83  | 75             | 90.4           |
| Caritas St. Elizabeth's<br>Medical Center of Boston  | 611                 | 213            | 34.9           | 461  | 58             | 12.6            | 186   | 176            | 94.6           |
| Charlton Memorial Hospital                           | 713                 | 229            | 32.1           | 692  | 96             | 13.9            | 204   | 202            | 99.0           |
| Cooley Dickinson Hospital                            | 375                 | 95             | 25.3           | 332  | 20             | 6.0             | 89  | 72             | 80.9           |
| Emerson Hospital                                     | 507                 | 198            | 39.1           | 444  | 35             | 7.9             | 181   | 164            | 90.6           |
| Fairview Hospital                                    | 75                  | 20             | 26.7           | 57   | 2              | -- <sup>4</sup> | 23  | 23             | 100.0          |
| Falmouth Hospital                                    | 265                 | 78             | 29.4           | 261  | 24             | 9.2             | 92  | 92             | 100.0          |
| Franklin Medical Center                              | 178                 | 52             | 29.2           | 200  | 15             | 7.5             | 59  | 49             | 83.1           |
| Harrington Memorial<br>Hospital                      | 159                 | 56             | 35.2           | 204  | 18             | 8.8             | 56  | 53             | 94.6           |
| Heywood Memorial Hospital                            | 233                 | 46             | 19.7           | 248  | 13             | 5.2             | 71  | 60             | 84.5           |
| Holyoke Hospital                                     | 285                 | 50             | 17.5           | 260  | 14             | 5.4             | 67  | 60             | 89.6           |
| Jordan Hospital                                      | 260                 | 104            | 40.0           | 271  | 31             | 11.4            | 78  | 72             | 92.3           |
| Lawrence General Hospital                            | 673                 | 165            | 24.5           | 759  | 69             | 9.1             | 267   | 248            | 92.9           |
| Leominster Hospital                                  | 466                 | 90             | 19.3           | 523  | 49             | 9.4             | 135   | 128            | 94.8           |
| Lowell General Hospital                              | 794                 | 242            | 30.5           | 778  | 83             | 10.7            | 228   | 211            | 92.5           |
| Martha's Vineyard Hospital                           | 95                  | 20             | 21.1           | 43   | 4              | -- <sup>4</sup> | 10  | 10             | 100.0          |
| Mary Lane Hospital                                   | 74                  | 27             | 36.5           | 81   | 7              | 8.6             | 31  | 31             | 100.0          |
| Massachusetts General<br>Hospital                    | 1,607               | 506            | 31.5           | 1,295  | 139            | 10.7            | 421   | 363            | 86.2           |
| Melrose-Wakefield Hospital                           | 579                 | 229            | 39.6           | 454  | 66             | 14.5            | 194   | 193            | 99.5           |
| Mercy Medical Center                                 | 535                 | 126            | 23.6           | 684  | 34             | 5.0             | 161   | 139            | 86.3           |
| Metrowest Medical Center-<br>Framingham Union Campus | 921                 | 339            | 36.8           | 781  | 105            | 13.4            | 254   | 253            | 99.6           |
| Milford Regional Medical<br>Center                   | 428                 | 146            | 34.1           | 330  | 33             | 10.0            | 131   | 128            | 97.7           |
| Morton Hospital                                      | 168                 | 56             | 33.3           | 200  | 30             | 15.0            | 73  | 68             | 93.2           |
| Mount Auburn Hospital                                | 899                 | 235            | 26.1           | 680  | 38             | 5.6             | 186   | 145            | 78.0           |
| Nantucket Cottage Hospital                           | 51                  | 16             | 31.4           | 48   | 4              | -- <sup>4</sup> | 12  | 11             | 91.7           |
| Newton Wellesley Hospital                            | 1,367               | 525            | 38.4           | 1,190  | 105            | 8.8             | 447   | 426            | 95.3           |

**Table 32 (cont.). Cesarean Section Deliveries for Singleton Births by Licensed Maternity Facility and Number of Previous Births, Massachusetts: 2005**

| Facility <sup>1</sup>                          | <u>First Birth</u>  |                |                | <u>Second or Later Birth<br/>without prior C-section</u> |                |                | <u>Second or Later Birth<br/>with prior C-section</u> |                |                |
|--|---------------------|----------------|----------------|--|----------------|----------------|---|----------------|----------------|
|  | Births <sup>2</sup> | C-section<br>n | % <sup>3</sup> | Births <sup>2</sup>                                      | C-section<br>n | % <sup>3</sup> | Births <sup>2</sup>                                   | C-section<br>n | % <sup>3</sup> |
| North Adams Regional Hospital                  | 116                 | 23             | 19.8           | 131  | 9              | 6.9            | 43  | 42             | 97.7           |
| North Shore Medical Center - Salem Hospital    | 821                 | 252            | 30.7           | 792  | 90             | 11.4           | 242   | 226            | 93.4           |
| Saint Vincent Hospital                         | 752                 | 198            | 26.3           | 715  | 57             | 8.0            | 228   | 178            | 78.1           |
| Saints Memorial Medical Ctr.-St. John's Campus | 264                 | 109            | 41.3           | 317  | 33             | 10.4           | 90  | 87             | 96.7           |
| South Shore Hospital                           | 1,497               | 578            | 38.6           | 1,512  | 148            | 9.8            | 530   | 492            | 92.8           |
| St. Luke's Hospital                            | 622                 | 167            | 26.8           | 729  | 53             | 7.3            | 206   | 201            | 97.6           |
| Sturdy Memorial Hospital                       | 458                 | 181            | 39.5           | 434  | 42             | 9.7            | 151   | 145            | 96.0           |
| Tobey Hospital                                 | 197                 | 36             | 18.3           | 239  | 14             | 5.9            | 42  | 33             | 78.6           |
| Tufts-New England Medical Center Hospital      | 512                 | 171            | 33.4           | 445  | 74             | 16.6           | 157   | 143            | 91.1           |
| UMASS Memorial Medical Center - West Campus    | 2,124               | 546            | 25.7           | 1,758  | 233            | 13.3           | 323   | 285            | 88.2           |
| Winchester Hospital                            | 851                 | 256            | 30.1           | 834  | 76             | 9.1            | 308   | 295            | 95.8           |

NOTES: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.

1. A licensed maternity facility is a medical unit licensed by the Commonwealth for the care of women during pregnancy and childbirth. 2. See Glossary for definitions of occurrence births. 3. The percentage of Cesarean births reported is not adjusted for risk factors such as mother's age, birthweight, or complications of labor and delivery, which would influence the number of procedures in a particular facility. Caution should be used when comparing unadjusted percentages. 4. Calculations based on fewer than five events are excluded.



**Table 33. Birth Characteristics<sup>1</sup>: Occurrence and Resident Births and Infant Deaths,  
Massachusetts Municipalities: 2005**

| Community           | Occurrence<br>Births <sup>2</sup> | Resident<br>Births <sup>3</sup> | Low<br>Birthweight <sup>4</sup> | Teen<br>Births<br>(15-19<br>years) | Infant<br>Deaths <sup>5</sup> | Neonatal<br>Deaths <sup>6</sup> | Fetal<br>Deaths <sup>7</sup> |
|---------------------|-----------------------------------|---------------------------------|---------------------------------|------------------------------------|-------------------------------|---------------------------------|------------------------------|
| <b>STATE TOTAL</b>  | <b>77,841</b>                     | <b>76,824</b>                   | <b>6,073</b>                    | <b>4,539</b>                       | <b>391</b>                    | <b>282</b>                      | <b>422</b>                   |
| Abington            | 0                                 | 212                             | 20                              | 5                                  | 2                             | 1                               | 0                            |
| Acton               | 1                                 | 207                             | 13                              | -- <sup>8</sup>                    | 1                             | 1                               | -- <sup>10</sup>             |
| Acushnet            | 0                                 | 92                              | 5                               | -- <sup>8</sup>                    | 1                             | 0                               | 0                            |
| Adams               | 0                                 | 89                              | -- <sup>1</sup>                 | 8                                  | 0                             | 0                               | 0                            |
| Agawam              | 0                                 | 290                             | 16                              | 9                                  | 2                             | 1                               | -- <sup>10</sup>             |
| Alford              | 0                                 | 4                               | 0                               | 0                                  | 0                             | 0                               | 0                            |
| Amesbury            | 0                                 | 190                             | 14                              | 12                                 | 0                             | 0                               | -- <sup>10</sup>             |
| Amherst             | 6                                 | 166                             | 10                              | 9                                  | 0                             | 0                               | 0                            |
| Andover             | 0                                 | 292                             | 13                              | -- <sup>8</sup>                    | 0                             | 0                               | 0                            |
| Aquinnah (Gay Head) | 1                                 | 2                               | 0                               | 0                                  | 0                             | 0                               | 0                            |
| Arlington           | 4                                 | 567                             | 41                              | 5                                  | 2                             | 1                               | 5                            |
| Ashburnham          | 0                                 | 65                              | 7                               | -- <sup>8</sup>                    | 0                             | 0                               | -- <sup>10</sup>             |
| Ashby               | 0                                 | 33                              | -- <sup>1</sup>                 | 5                                  | 0                             | 0                               | 0                            |
| Ashfield            | 0                                 | 10                              | 0                               | -- <sup>8</sup>                    | 0                             | 0                               | 0                            |
| Ashland             | 1                                 | 263                             | 11                              | -- <sup>8</sup>                    | 0                             | 0                               | 0                            |
| Athol               | 1                                 | 138                             | 11                              | 13                                 | 0                             | 0                               | -- <sup>10</sup>             |
| Attleboro           | 1,076                             | 622                             | 53                              | 29                                 | 2                             | 1                               | -- <sup>10</sup>             |
| Auburn              | 1                                 | 161                             | 8                               | 6                                  | 1                             | 1                               | -- <sup>10</sup>             |
| Avon                | 0                                 | 45                              | 7                               | 0                                  | 0                             | 0                               | 0                            |
| Ayer                | 1                                 | 110                             | 10                              | 5                                  | 0                             | 0                               | -- <sup>10</sup>             |
| Barnstable          | 1,010                             | 454                             | 28                              | 29                                 | 3                             | 1                               | -- <sup>10</sup>             |
| Barre               | 0                                 | 54                              | 7                               | -- <sup>8</sup>                    | 0                             | 0                               | 0                            |
| Becket              | 0                                 | 22                              | -- <sup>1</sup>                 | -- <sup>8</sup>                    | 0                             | 0                               | 0                            |
| Bedford             | 0                                 | 105                             | 5                               | -- <sup>8</sup>                    | 2                             | 1                               | -- <sup>10</sup>             |
| Belchertown         | 1                                 | 164                             | 15                              | -- <sup>8</sup>                    | 0                             | 0                               | 0                            |
| Bellingham          | 1                                 | 204                             | 13                              | 11                                 | 2                             | 2                               | 0                            |
| Belmont             | 0                                 | 249                             | 18                              | -- <sup>8</sup>                    | 0                             | 0                               | -- <sup>10</sup>             |
| Berkley             | 1                                 | 78                              | -- <sup>1</sup>                 | -- <sup>8</sup>                    | 0                             | 0                               | -- <sup>10</sup>             |
| Berlin              | 0                                 | 30                              | 6                               | 0                                  | 0                             | 0                               | 0                            |
| Bernardston         | 0                                 | 17                              | 0                               | 0                                  | 0                             | 0                               | 0                            |
| Beverly             | 2,152                             | 441                             | 27                              | 11                                 | 0                             | 0                               | -- <sup>10</sup>             |
| Billerica           | 2                                 | 477                             | 45                              | 8                                  | 2                             | 0                               | 0                            |
| Blackstone          | 1                                 | 94                              | 7                               | 8                                  | 1                             | 1                               | 0                            |
| Blandford           | 0                                 | 9                               | 0                               | 0                                  | 0                             | 0                               | 0                            |
| Bolton              | 0                                 | 61                              | -- <sup>1</sup>                 | 0                                  | 0                             | 0                               | 0                            |
| Boston              | 21,672                            | 7,554                           | 726                             | 566                                | 39                            | 32                              | 56                           |
| Bourne              | 1                                 | 224                             | 18                              | 16                                 | 1                             | 0                               | 0                            |
| Boxborough          | 0                                 | 48                              | -- <sup>1</sup>                 | 0                                  | 0                             | 0                               | 0                            |
| Boxford             | 0                                 | 78                              | 5                               | -- <sup>8</sup>                    | 0                             | 0                               | 0                            |
| Boylston            | 0                                 | 51                              | 7                               | -- <sup>8</sup>                    | 0                             | 0                               | 0                            |
| Braintree           | 0                                 | 374                             | 19                              | 5                                  | 1                             | 0                               | -- <sup>10</sup>             |
| Brewster            | 0                                 | 80                              | 7                               | -- <sup>8</sup>                    | 1                             | 0                               | 0                            |
| Bridgewater         | 0                                 | 252                             | 24                              | 6                                  | 0                             | 0                               | -- <sup>10</sup>             |
| Brimfield           | 0                                 | 27                              | -- <sup>1</sup>                 | -- <sup>8</sup>                    | 0                             | 0                               | -- <sup>10</sup>             |

**Table 33 (cont.). Birth Characteristics: Occurrence and Resident Births and Infant Deaths, Massachusetts Municipalities: 2005**

| <b>Community</b> | <b>Occurrence Births<sup>2</sup></b> | <b>Resident Births<sup>3</sup></b> | <b>Low Birthweight<sup>4</sup></b> | <b>Teen Births (15-19 years)</b> | <b>Infant Deaths<sup>5</sup></b> | <b>Neonatal Deaths<sup>6</sup></b> | <b>Fetal Deaths<sup>7</sup></b> |
|------------------|--------------------------------------|------------------------------------|------------------------------------|----------------------------------|----------------------------------|------------------------------------|---------------------------------|
| Brockton         | 2,342                                | 1,541                              | 177                                | 148                              | 10                               | 9                                  | 18                              |
| Brookfield       | 0                                    | 31                                 | -- <sup>1</sup>                    | -- <sup>8</sup>                  | 0                                | 0                                  | 0                               |
| Brookline        | 3                                    | 613                                | 37                                 | -- <sup>8</sup>                  | 4                                | 3                                  |                                 |
| Buckland         | 0                                    | 8                                  | 0                                  | 0                                | 0                                | 0                                  | 0                               |
| Burlington       | 0                                    | 257                                | 12                                 | -- <sup>8</sup>                  | 2                                | 2                                  | 0                               |
| Cambridge        | 3,105                                | 1,027                              | 74                                 | 20                               | 2                                | 1                                  |                                 |
| Canton           | 1                                    | 237                                | 17                                 | -- <sup>8</sup>                  | 1                                | 1                                  |                                 |
| Carlisle         | 1                                    | 23                                 | -- <sup>1</sup>                    | 0                                | 0                                | 0                                  | 0                               |
| Carver           | 0                                    | 120                                | 9                                  | 7                                | 0                                | 0                                  | 0                               |
| Charlemont       | 0                                    | 6                                  | -- <sup>1</sup>                    | 0                                | 0                                | 0                                  | 0                               |
| Charlton         | 1                                    | 164                                | 10                                 | -- <sup>8</sup>                  | 0                                | 0                                  |                                 |
| Chatham          | 0                                    | 28                                 | -- <sup>1</sup>                    | 0                                | 0                                | 0                                  | 0                               |
| Chelmsford       | 1                                    | 363                                | 27                                 | 9                                | 1                                | 1                                  |                                 |
| Chelsea          | 1                                    | 649                                | 49                                 | 75                               | 5                                | 2                                  | 6                               |
| Cheshire         | 0                                    | 26                                 | -- <sup>1</sup>                    | -- <sup>8</sup>                  | 0                                | 0                                  |                                 |
| Chester          | 0                                    | 7                                  | 0                                  | 0                                | 0                                | 0                                  | 0                               |
| Chesterfield     | 0                                    | 7                                  | 0                                  | 0                                | 0                                | 0                                  | 0                               |
| Chicopee         | 0                                    | 608                                | 42                                 | 72                               | 0                                | 0                                  | 7                               |
| Chilmark         | 0                                    | 6                                  | 0                                  | 0                                | 0                                | 0                                  | 0                               |
| Clarksburg       | 0                                    | 12                                 | 0                                  | -- <sup>8</sup>                  | 0                                | 0                                  | 0                               |
| Clinton          | 1                                    | 216                                | 15                                 | 16                               | 1                                | 1                                  | 0                               |
| Cohasset         | 0                                    | 80                                 | 5                                  | 0                                | 0                                | 0                                  | 0                               |
| Colrain          | 0                                    | 15                                 | 0                                  | -- <sup>8</sup>                  | 0                                | 0                                  | 0                               |
| Concord          | 1,170                                | 108                                | 11                                 | -- <sup>8</sup>                  | 0                                | 0                                  | 0                               |
| Conway           | 0                                    | 18                                 | -- <sup>1</sup>                    | 0                                | 0                                | 0                                  | 0                               |
| Cummington       | 1                                    | 4                                  | 0                                  | 0                                | 0                                | 0                                  | 0                               |
| Dalton           | 0                                    | 54                                 | 6                                  | -- <sup>8</sup>                  | 0                                | 0                                  | 0                               |
| Danvers          | 1                                    | 229                                | 17                                 | -- <sup>8</sup>                  | 0                                | 0                                  |                                 |
| Dartmouth        | 2                                    | 245                                | 25                                 | 15                               | 2                                | 1                                  |                                 |
| Dedham           | 0                                    | 246                                | 14                                 | 6                                | 1                                | 0                                  |                                 |
| Deerfield        | 0                                    | 42                                 | -- <sup>1</sup>                    | 0                                | 0                                | 0                                  | 0                               |
| Dennis           | 1                                    | 123                                | 8                                  | 14                               | 0                                | 0                                  | 0                               |
| Dighton          | 0                                    | 82                                 | 5                                  | -- <sup>8</sup>                  | 0                                | 0                                  | 0                               |
| Douglas          | 0                                    | 119                                | 6                                  | -- <sup>8</sup>                  | 0                                | 0                                  |                                 |
| Dover            | 1                                    | 46                                 | 5                                  | 0                                | 0                                | 0                                  | 0                               |
| Dracut           | 2                                    | 373                                | 25                                 | 15                               | 2                                | 2                                  |                                 |
| Dudley           | 0                                    | 121                                | 5                                  | 6                                | 0                                | 0                                  |                                 |
| Dunstable        | 0                                    | 34                                 | -- <sup>1</sup>                    | -- <sup>8</sup>                  | 0                                | 0                                  | 0                               |
| Duxbury          | 1                                    | 127                                | 6                                  | 0                                | 0                                | 0                                  | 0                               |
| East Bridgewater | 1                                    | 160                                | 18                                 | -- <sup>8</sup>                  | 0                                | 0                                  | 0                               |
| East Brookfield  | 0                                    | 24                                 | 5                                  | -- <sup>8</sup>                  | 0                                | 0                                  | 0                               |
| East Longmeadow  | 0                                    | 151                                | 10                                 | -- <sup>8</sup>                  | 0                                | 0                                  | 0                               |
| Eastham          | 0                                    | 35                                 | -- <sup>1</sup>                    | 5                                | 0                                | 0                                  |                                 |
| Easthampton      | 3                                    | 157                                | 15                                 | 13                               | 1                                | 1                                  | 0                               |
| Easton           | 0                                    | 205                                | 14                                 | -- <sup>8</sup>                  | 0                                | 0                                  | 0                               |
| Edgartown        | 0                                    | 44                                 | -- <sup>1</sup>                    | -- <sup>8</sup>                  | 1                                | 0                                  | 0                               |
| Egremont         | 0                                    | 9                                  | -- <sup>1</sup>                    | -- <sup>8</sup>                  | 0                                | 0                                  | 0                               |

**Table 33 (cont.). Birth Characteristics: Occurrence and Resident Births and Infant Deaths, Massachusetts Municipalities: 2005**

| <b>Community</b> | <b>Occurrence Births<sup>2</sup></b> | <b>Resident Births<sup>3</sup></b> | <b>Low Birthweight<sup>4</sup></b> | <b>Teen Births (15-19 years)</b> | <b>Infant Deaths<sup>5</sup></b> | <b>Neonatal Deaths<sup>6</sup></b> | <b>Fetal Deaths<sup>7</sup></b> |
|------------------|--------------------------------------|------------------------------------|------------------------------------|----------------------------------|----------------------------------|------------------------------------|---------------------------------|
| Erving           | 1                                    | 13                                 | 0                                  | -- <sup>8</sup>                  | 0                                | 0                                  | 0                               |
| Essex            | 1                                    | 46                                 | 8                                  | 0                                | 0                                | 0                                  | 0                               |
| Everett          | 1                                    | 587                                | 34                                 | 35                               | 3                                | 2                                  | -- <sup>10</sup>                |
| Fairhaven        | 0                                    | 167                                | 9                                  | 12                               | 0                                | 0                                  | -- <sup>10</sup>                |
| Fall River       | 1,648                                | 1,196                              | 94                                 | 140                              | 9                                | 3                                  | -- <sup>10</sup>                |
| Falmouth         | 638                                  | 291                                | 26                                 | 14                               | 0                                | 0                                  | 0                               |
| Fitchburg        | 0                                    | 572                                | 50                                 | 62                               | 4                                | 3                                  | 6                               |
| Florida          | 0                                    | 4                                  | 0                                  | -- <sup>8</sup>                  | 0                                | 0                                  | 0                               |
| Foxborough       | 0                                    | 163                                | 10                                 | -- <sup>8</sup>                  | 0                                | 0                                  | -- <sup>10</sup>                |
| Framingham       | 2,019                                | 1,005                              | 80                                 | 45                               | 6                                | 5                                  | 5                               |
| Franklin         | 1                                    | 427                                | 31                                 | -- <sup>8</sup>                  | 4                                | 3                                  | -- <sup>10</sup>                |
| Freetown         | 0                                    | 82                                 | 9                                  | -- <sup>8</sup>                  | 1                                | 1                                  | -- <sup>10</sup>                |
| Gardner          | 565                                  | 236                                | 21                                 | 25                               | 5                                | 3                                  | -- <sup>10</sup>                |
| Georgetown       | 0                                    | 88                                 | 8                                  | 0                                | 0                                | 0                                  | 0                               |
| Gill             | 0                                    | 17                                 | -- <sup>1</sup>                    | 0                                | 0                                | 0                                  | 0                               |
| Gloucester       | 0                                    | 272                                | 15                                 | 10                               | 0                                | 0                                  | -- <sup>10</sup>                |
| Goshen           | 0                                    | 7                                  | 0                                  | 0                                | 0                                | 0                                  | 0                               |
| Gosnold          | 0                                    | 2                                  | 0                                  | 0                                | 0                                | 0                                  | 0                               |
| Grafton          | 3                                    | 261                                | 23                                 | -- <sup>8</sup>                  | 1                                | 1                                  | -- <sup>10</sup>                |
| Granby           | 0                                    | 55                                 | 5                                  | -- <sup>8</sup>                  | 0                                | 0                                  | 0                               |
| Granville        | 0                                    | 16                                 | -- <sup>1</sup>                    | -- <sup>8</sup>                  | 0                                | 0                                  | 0                               |
| Great Barrington | 165                                  | 59                                 | -- <sup>1</sup>                    | -- <sup>8</sup>                  | 0                                | 0                                  | -- <sup>10</sup>                |
| Greenfield       | 462                                  | 194                                | 16                                 | 14                               | 4                                | 3                                  | 0                               |
| Groton           | 1                                    | 88                                 | 11                                 | -- <sup>8</sup>                  | 1                                | 1                                  | 0                               |
| Groveland        | 0                                    | 63                                 | -- <sup>1</sup>                    | -- <sup>8</sup>                  | 0                                | 0                                  | 0                               |
| Hadley           | 0                                    | 42                                 | 8                                  | -- <sup>8</sup>                  | 1                                | 1                                  | 0                               |
| Halifax          | 0                                    | 80                                 | -- <sup>1</sup>                    | 9                                | 0                                | 0                                  | 0                               |
| Hamilton         | 2                                    | 110                                | -- <sup>1</sup>                    | 0                                | 0                                | 0                                  | 0                               |
| Hampden          | 0                                    | 31                                 | -- <sup>1</sup>                    | 0                                | 0                                | 0                                  | 0                               |
| Hancock          | 0                                    | 3                                  | 0                                  | 0                                | 0                                | 0                                  | 0                               |
| Hanover          | 1                                    | 136                                | 7                                  | -- <sup>8</sup>                  | 0                                | 0                                  | 0                               |
| Hanson           | 0                                    | 117                                | 9                                  | -- <sup>8</sup>                  | 0                                | 0                                  | 0                               |
| Hardwick         | 0                                    | 15                                 | -- <sup>1</sup>                    | -- <sup>8</sup>                  | 1                                | 0                                  | 0                               |
| Harvard          | 0                                    | 34                                 | -- <sup>1</sup>                    | 0                                | 0                                | 0                                  | 0                               |
| Harwich          | 1                                    | 102                                | -- <sup>1</sup>                    | 6                                | 2                                | 1                                  | 0                               |
| Hatfield         | 0                                    | 25                                 | 0                                  | 0                                | 0                                | 0                                  | 0                               |
| Haverhill        | 2                                    | 824                                | 65                                 | 59                               | 3                                | 2                                  | -- <sup>10</sup>                |
| Hawley           | 0                                    | 2                                  | 0                                  | -- <sup>8</sup>                  | 0                                | 0                                  | 0                               |
| Heath            | 0                                    | 3                                  | -- <sup>1</sup>                    | 0                                | 0                                | 0                                  | 0                               |
| Hingham          | 0                                    | 258                                | 18                                 | -- <sup>8</sup>                  | 1                                | 0                                  | -- <sup>10</sup>                |
| Hinsdale         | 0                                    | 16                                 | -- <sup>1</sup>                    | 0                                | 0                                | 0                                  | 0                               |
| Holbrook         | 0                                    | 140                                | 8                                  | 6                                | 0                                | 0                                  | -- <sup>10</sup>                |
| Holden           | 1                                    | 171                                | 8                                  | -- <sup>8</sup>                  | 0                                | 0                                  | -- <sup>10</sup>                |
| Holland          | 0                                    | 27                                 | -- <sup>1</sup>                    | -- <sup>8</sup>                  | 0                                | 0                                  | 0                               |
| Holliston        | 0                                    | 154                                | 11                                 | -- <sup>8</sup>                  | 2                                | 1                                  | -- <sup>10</sup>                |
| Holyoke          | 622                                  | 642                                | 56                                 | 146                              | 6                                | 3                                  | -- <sup>10</sup>                |
| Hopedale         | 0                                    | 75                                 | 7                                  | -- <sup>8</sup>                  | 0                                | 0                                  | 0                               |

**Table 33 (cont.). Birth Characteristics: Occurrence and Resident Births and Infant Deaths, Massachusetts Municipalities: 2005**

| <b>Community</b>      | <b>Occurrence Births<sup>2</sup></b> | <b>Resident Births<sup>3</sup></b> | <b>Low Birthweight<sup>4</sup></b> | <b>Teen Births (15-19 years)</b> | <b>Infant Deaths<sup>5</sup></b> | <b>Neonatal Deaths<sup>6</sup></b> | <b>Fetal Deaths<sup>7</sup></b> |
|-----------------------|--------------------------------------|------------------------------------|------------------------------------|----------------------------------|----------------------------------|------------------------------------|---------------------------------|
| Hopkinton             | 2                                    | 182                                | 12                                 | 5                                | 0                                | 0                                  | -- <sup>10</sup>                |
| Hubbardston           | 1                                    | 55                                 | 8                                  | -- <sup>8</sup>                  | 0                                | 0                                  | 0                               |
| Hudson                | 0                                    | 256                                | 24                                 | -- <sup>8</sup>                  | 2                                | 2                                  | 0                               |
| Hull                  | 1                                    | 89                                 | -- <sup>1</sup>                    | 5                                | 0                                | 0                                  | 0                               |
| Huntington            | 0                                    | 18                                 | -- <sup>1</sup>                    | 0                                | 0                                | 0                                  | -- <sup>10</sup>                |
| Ipswich               | 0                                    | 136                                | 11                                 | -- <sup>8</sup>                  | 0                                | 0                                  | 0                               |
| Kingston              | 0                                    | 150                                | 15                                 | -- <sup>8</sup>                  | 1                                | 1                                  | -- <sup>10</sup>                |
| Lakeville             | 0                                    | 120                                | 12                                 | 6                                | 0                                | 0                                  | 0                               |
| Lancaster             | 0                                    | 79                                 | 5                                  | -- <sup>8</sup>                  | 1                                | 0                                  | 0                               |
| Lanesborough          | 0                                    | 23                                 | -- <sup>1</sup>                    | -- <sup>8</sup>                  | 0                                | 0                                  | 0                               |
| Lawrence              | 1,742                                | 1,460                              | 131                                | 217                              | 11                               | 9                                  | 7                               |
| Lee                   | 1                                    | 57                                 | 7                                  | -- <sup>8</sup>                  | 0                                | 0                                  | 0                               |
| Leicester             | 1                                    | 109                                | -- <sup>1</sup>                    | 7                                | 0                                | 0                                  | 0                               |
| Lenox                 | 1                                    | 42                                 | -- <sup>1</sup>                    | -- <sup>8</sup>                  | 0                                | 0                                  | -- <sup>10</sup>                |
| Leominster            | 1,155                                | 514                                | 28                                 | 22                               | 2                                | 2                                  | -- <sup>10</sup>                |
| Leverett              | 1                                    | 11                                 | 0                                  | 0                                | 0                                | 0                                  | 0                               |
| Lexington             | 4                                    | 209                                | 19                                 | -- <sup>8</sup>                  | 2                                | 2                                  | 0                               |
| Leyden                | 0                                    | 2                                  | 0                                  | 0                                | 0                                | 0                                  | 0                               |
| Lincoln               | 1                                    | 74                                 | -- <sup>1</sup>                    | -- <sup>8</sup>                  | 0                                | 0                                  | 0                               |
| Littleton             | 0                                    | 118                                | 8                                  | -- <sup>8</sup>                  | 0                                | 0                                  | -- <sup>10</sup>                |
| Longmeadow            | 0                                    | 128                                | 12                                 | -- <sup>8</sup>                  | 0                                | 0                                  | 0                               |
| Lowell                | 2,540                                | 1,667                              | 153                                | 204                              | 11                               | 5                                  | 8                               |
| Ludlow                | 0                                    | 180                                | 14                                 | 8                                | 0                                | 0                                  | -- <sup>10</sup>                |
| Lunenburg             | 1                                    | 101                                | -- <sup>1</sup>                    | -- <sup>8</sup>                  | 0                                | 0                                  | 0                               |
| Lynn                  | 4                                    | 1,480                              | 123                                | 146                              | 4                                | 4                                  | 15                              |
| Lynnfield             | 0                                    | 89                                 | 5                                  | -- <sup>8</sup>                  | 1                                | 1                                  | 0                               |
| Malden                | 2                                    | 792                                | 76                                 | 23                               | 9                                | 9                                  | 7                               |
| Manchester-by-the-Sea | 0                                    | 53                                 | 7                                  | 0                                | 0                                | 0                                  | 0                               |
| Mansfield             | 0                                    | 279                                | 14                                 | -- <sup>8</sup>                  | 0                                | 0                                  | -- <sup>10</sup>                |
| Marblehead            | 0                                    | 183                                | 12                                 | 0                                | 0                                | 0                                  | -- <sup>10</sup>                |
| Marion                | 0                                    | 39                                 | -- <sup>1</sup>                    | -- <sup>8</sup>                  | 0                                | 0                                  | -- <sup>10</sup>                |
| Marlborough           | 2                                    | 599                                | 45                                 | 24                               | 7                                | 6                                  | -- <sup>10</sup>                |
| Marshfield            | 0                                    | 290                                | 15                                 | 6                                | 2                                | 2                                  | -- <sup>10</sup>                |
| Mashpee               | 1                                    | 150                                | 9                                  | 7                                | 1                                | 0                                  | -- <sup>10</sup>                |
| Mattapoisett          | 0                                    | 56                                 | 5                                  | -- <sup>8</sup>                  | 0                                | 0                                  | -- <sup>10</sup>                |
| Maynard               | 1                                    | 140                                | 9                                  | -- <sup>8</sup>                  | 0                                | 0                                  | 0                               |
| Medfield              | 0                                    | 120                                | 10                                 | -- <sup>8</sup>                  | 0                                | 0                                  | 0                               |
| Medford               | 2                                    | 606                                | 47                                 | 13                               | 2                                | 2                                  | -- <sup>10</sup>                |
| Medway                | 0                                    | 143                                | 12                                 | -- <sup>8</sup>                  | 0                                | 0                                  | 0                               |
| Melrose               | 1,268                                | 285                                | 11                                 | -- <sup>8</sup>                  | 2                                | 1                                  | 0                               |
| Mendon                | 1                                    | 47                                 | -- <sup>1</sup>                    | 0                                | 0                                | 0                                  | 0                               |
| Merrimac              | 0                                    | 60                                 | 6                                  | -- <sup>8</sup>                  | 1                                | 1                                  | 0                               |
| Methuen               | 1,323                                | 582                                | 38                                 | 36                               | 2                                | 0                                  | 0                               |
| Middleborough         | 1                                    | 292                                | 23                                 | 21                               | 1                                | 1                                  | -- <sup>10</sup>                |
| Middlefield           | 0                                    | 4                                  | 0                                  | 0                                | 0                                | 0                                  | 0                               |
| Middleton             | 1                                    | 65                                 | 10                                 | -- <sup>8</sup>                  | 0                                | 0                                  | 0                               |
| Milford               | 917                                  | 415                                | 26                                 | 15                               | 0                                | 0                                  | -- <sup>10</sup>                |

**Table 33 (cont.). Birth Characteristics: Occurrence and Resident Births and Infant Deaths, Massachusetts Municipalities: 2005**

| <b>Community</b> | <b>Occurrence Births<sup>2</sup></b> | <b>Resident Births<sup>3</sup></b> | <b>Low Birthweight<sup>4</sup></b> | <b>Teen Births (15-19 years)</b> | <b>Infant Deaths<sup>5</sup></b> | <b>Neonatal Deaths<sup>6</sup></b> | <b>Fetal Deaths<sup>7</sup></b> |
|------------------|--------------------------------------|------------------------------------|------------------------------------|----------------------------------|----------------------------------|------------------------------------|---------------------------------|
| Millbury         | 1                                    | 150                                | 5                                  | 6                                | 0                                | 0                                  | -- <sup>10</sup>                |
| Millis           | 1                                    | 108                                | 6                                  | 0                                | 0                                | 0                                  | 0                               |
| Millville        | 0                                    | 43                                 | -- <sup>1</sup>                    | -- <sup>8</sup>                  | 1                                | 1                                  | 0                               |
| Milton           | 0                                    | 314                                | 26                                 | 5                                | 1                                | 1                                  | 0                               |
| Monroe           | 0                                    | 0                                  | 0                                  | 0                                | 0                                | 0                                  | 0                               |
| Monson           | 0                                    | 75                                 | -- <sup>1</sup>                    | 5                                | 0                                | 0                                  | -- <sup>10</sup>                |
| Montague         | 2                                    | 105                                | 5                                  | 13                               | 0                                | 0                                  | -- <sup>10</sup>                |
| Monterey         | 0                                    | 6                                  | 0                                  | 0                                | 0                                | 0                                  | 0                               |
| Montgomery       | 0                                    | 4                                  | 0                                  | 0                                | 0                                | 0                                  | 0                               |
| Mount Washington | 0                                    | 0                                  | 0                                  | 0                                | 0                                | 0                                  | 0                               |
| Nahant           | 0                                    | 18                                 | 0                                  | 0                                | 0                                | 0                                  | 0                               |
| Nantucket        | 117                                  | 155                                | 10                                 | 5                                | 0                                | 0                                  | -- <sup>10</sup>                |
| Natick           | 3                                    | 418                                | 30                                 | -- <sup>8</sup>                  | 0                                | 0                                  | -- <sup>10</sup>                |
| Needham          | 0                                    | 298                                | 11                                 | -- <sup>8</sup>                  | 0                                | 0                                  | -- <sup>10</sup>                |
| New Ashford      | 0                                    | 3                                  | -- <sup>1</sup>                    | 0                                | 1                                | 1                                  | 0                               |
| New Bedford      | 1,610                                | 1,391                              | 148                                | 174                              | 12                               | 7                                  | 8                               |
| New Braintree    | 2                                    | 11                                 | -- <sup>1</sup>                    | 0                                | 0                                | 0                                  | 0                               |
| New Marlborough  | 1                                    | 11                                 | -- <sup>1</sup>                    | 0                                | 0                                | 0                                  | 0                               |
| New Salem        | 0                                    | 6                                  | 0                                  | 0                                | 0                                | 0                                  | 0                               |
| Newbury          | 0                                    | 69                                 | 5                                  | -- <sup>8</sup>                  | 0                                | 0                                  | 0                               |
| Newburyport      | 710                                  | 210                                | 15                                 | 12                               | 1                                | 1                                  | 0                               |
| Newton           | 3,188                                | 788                                | 51                                 | -- <sup>8</sup>                  | 3                                | 3                                  | -- <sup>10</sup>                |
| Norfolk          | 2                                    | 116                                | 9                                  | -- <sup>8</sup>                  | 0                                | 0                                  | -- <sup>10</sup>                |
| North Adams      | 295                                  | 155                                | 14                                 | 28                               | 0                                | 0                                  | -- <sup>10</sup>                |
| North Andover    | 0                                    | 325                                | 22                                 | 5                                | 4                                | 4                                  | 0                               |
| North Attleboro  | 3                                    | 363                                | 18                                 | 9                                | 0                                | 0                                  | -- <sup>10</sup>                |
| North Brookfield | 0                                    | 45                                 | -- <sup>1</sup>                    | -- <sup>8</sup>                  | 0                                | 0                                  | -- <sup>10</sup>                |
| North Reading    | 0                                    | 149                                | 11                                 | -- <sup>8</sup>                  | 0                                | 0                                  | 0                               |
| Northampton      | 835                                  | 191                                | 17                                 | 9                                | 2                                | 1                                  | -- <sup>10</sup>                |
| Northborough     | 2                                    | 155                                | 11                                 | -- <sup>8</sup>                  | 2                                | 0                                  | -- <sup>10</sup>                |
| Northbridge      | 0                                    | 198                                | 13                                 | 6                                | 0                                | 0                                  | -- <sup>10</sup>                |
| Northfield       | 0                                    | 27                                 | -- <sup>1</sup>                    | -- <sup>8</sup>                  | 0                                | 0                                  | -- <sup>10</sup>                |
| Norton           | 0                                    | 232                                | 20                                 | 6                                | 0                                | 0                                  | -- <sup>10</sup>                |
| Norwell          | 0                                    | 109                                | 6                                  | 0                                | 0                                | 0                                  | 0                               |
| Norwood          | 559                                  | 364                                | 36                                 | 14                               | 3                                | 3                                  | -- <sup>10</sup>                |
| Oak Bluffs       | 152                                  | 54                                 | -- <sup>1</sup>                    | -- <sup>8</sup>                  | 0                                | 0                                  | 0                               |
| Oakham           | 0                                    | 18                                 | -- <sup>1</sup>                    | 0                                | 0                                | 0                                  | 0                               |
| Orange           | 1                                    | 78                                 | 5                                  | 8                                | 0                                | 0                                  | -- <sup>10</sup>                |
| Orleans          | 1                                    | 37                                 | -- <sup>1</sup>                    | -- <sup>8</sup>                  | 0                                | 0                                  | 0                               |
| Otis             | 0                                    | 11                                 | -- <sup>1</sup>                    | -- <sup>8</sup>                  | 0                                | 0                                  | 0                               |
| Oxford           | 0                                    | 161                                | 14                                 | 9                                | 1                                | 1                                  | -- <sup>10</sup>                |
| Palmer           | 1                                    | 138                                | 10                                 | 11                               | 0                                | 0                                  | 0                               |
| Paxton           | 0                                    | 32                                 | -- <sup>1</sup>                    | 0                                | 0                                | 0                                  | 0                               |
| Peabody          | 0                                    | 486                                | 47                                 | 15                               | 2                                | 2                                  | -- <sup>10</sup>                |
| Pelham           | 1                                    | 6                                  | -- <sup>1</sup>                    | -- <sup>8</sup>                  | 0                                | 0                                  | 0                               |
| Pembroke         | 1                                    | 202                                | 20                                 | 7                                | 3                                | 1                                  | 0                               |

**Table 33 (cont.). Birth Characteristics: Occurrence and Resident Births and Infant Deaths, Massachusetts Municipalities: 2005**

| Community    | Occurrence Births <sup>2</sup> | Resident Births <sup>3</sup> | Low Birthweight <sup>4</sup> | Teen Births (15-19 years) | Infant Deaths <sup>5</sup> | Neonatal Deaths <sup>6</sup> | Fetal Deaths <sup>7</sup> |
|--------------|--------------------------------|------------------------------|------------------------------|---------------------------|----------------------------|------------------------------|---------------------------|
| Pepperell    | 2                              | 124                          | 5                            | 5                         | 0                          | 0                            | -- <sup>10</sup>          |
| Peru         | 0                              | 5                            | 0                            | -- <sup>8</sup>           | 0                          | 0                            | 0                         |
| Petersham    | 1                              | 14                           | -- <sup>1</sup>              | -- <sup>8</sup>           | 0                          | 0                            | -- <sup>10</sup>          |
| Phillipston  | 0                              | 15                           | -- <sup>1</sup>              | -- <sup>8</sup>           | 0                          | 0                            | 0                         |
| Pittsfield   | 773                            | 526                          | 44                           | 67                        | 2                          | 2                            | -- <sup>10</sup>          |
| Plainfield   | 0                              | 3                            | 0                            | 0                         | 0                          | 0                            | 0                         |
| Plainville   | 0                              | 103                          | 10                           | -- <sup>8</sup>           | 0                          | 0                            | 0                         |
| Plymouth     | 624                            | 658                          | 56                           | 26                        | 3                          | 1                            | 8                         |
| Plympton     | 0                              | 27                           | 7                            | -- <sup>8</sup>           | 1                          | 1                            | 0                         |
| Princeton    | 0                              | 19                           | -- <sup>1</sup>              | -- <sup>8</sup>           | 0                          | 0                            | -- <sup>10</sup>          |
| Provincetown | 0                              | 10                           | 0                            | 0                         | 0                          | 0                            | 0                         |
| Quincy       | 7                              | 1,140                        | 83                           | 48                        | 5                          | 3                            | -- <sup>10</sup>          |
| Randolph     | 0                              | 356                          | 30                           | 14                        | 5                          | 2                            | -- <sup>10</sup>          |
| Raynham      | 0                              | 160                          | 13                           | 8                         | 2                          | 2                            | 0                         |
| Reading      | 2                              | 301                          | 25                           | -- <sup>8</sup>           | 0                          | 0                            | -- <sup>10</sup>          |
| Rehoboth     | 0                              | 112                          | 7                            | 5                         | 1                          | 1                            | 0                         |
| Revere       | 1                              | 642                          | 70                           | 48                        | 7                          | 7                            | -- <sup>10</sup>          |
| Richmond     | 0                              | 9                            | -- <sup>1</sup>              | 0                         | 0                          | 0                            | 0                         |
| Rochester    | 0                              | 41                           | -- <sup>1</sup>              | 0                         | 0                          | 0                            | 0                         |
| Rockland     | 0                              | 219                          | 17                           | 12                        | 2                          | 2                            | -- <sup>10</sup>          |
| Rockport     | 1                              | 47                           | -- <sup>1</sup>              | -- <sup>8</sup>           | 0                          | 0                            | 0                         |
| Rowe         | 0                              | 1                            | NA <sup>9</sup>              | NA <sup>9</sup>           | 0                          | 0                            | 0                         |
| Rowley       | 0                              | 74                           | 5                            | -- <sup>8</sup>           | 0                          | 0                            | 0                         |
| Royalston    | 0                              | 11                           | 0                            | 0                         | 0                          | 0                            | 0                         |
| Russell      | 2                              | 18                           | 0                            | -- <sup>8</sup>           | 0                          | 0                            | 0                         |
| Rutland      | 0                              | 98                           | 7                            | -- <sup>8</sup>           | 0                          | 0                            | -- <sup>10</sup>          |
| Salem        | 1,915                          | 542                          | 35                           | 25                        | 1                          | 1                            | -- <sup>10</sup>          |
| Salisbury    | 1                              | 75                           | 7                            | 5                         | 2                          | 1                            | -- <sup>10</sup>          |
| Sandisfield  | 0                              | 7                            | 0                            | 0                         | 0                          | 0                            | 0                         |
| Sandwich     | 1                              | 208                          | 12                           | 8                         | 0                          | 0                            | 0                         |
| Saugus       | 0                              | 256                          | 17                           | 6                         | 2                          | 1                            | 0                         |
| Savoy        | 0                              | 8                            | 0                            | 0                         | 0                          | 0                            | 0                         |
| Scituate     | 1                              | 175                          | 15                           | -- <sup>8</sup>           | 1                          | 1                            | -- <sup>10</sup>          |
| Seekonk      | 0                              | 101                          | 10                           | -- <sup>8</sup>           | 0                          | 0                            | 0                         |
| Sharon       | 0                              | 144                          | 20                           | -- <sup>8</sup>           | 0                          | 0                            | -- <sup>10</sup>          |
| Sheffield    | 0                              | 35                           | -- <sup>1</sup>              | 0                         | 0                          | 0                            | 0                         |
| Shelburne    | 1                              | 15                           | -- <sup>1</sup>              | 0                         | 0                          | 0                            | 0                         |
| Sherborn     | 0                              | 33                           | -- <sup>1</sup>              | 0                         | 0                          | 0                            | 0                         |
| Shirley      | 0                              | 65                           | -- <sup>1</sup>              | -- <sup>8</sup>           | 0                          | 0                            | 0                         |
| Shrewsbury   | 1                              | 429                          | 34                           | 7                         | 0                          | 0                            | -- <sup>10</sup>          |
| Shutesbury   | 8                              | 22                           | -- <sup>1</sup>              | -- <sup>8</sup>           | 0                          | 0                            | 0                         |
| Somerset     | 0                              | 130                          | 5                            | 6                         | 0                          | 0                            | 0                         |
| Somerville   | 3                              | 902                          | 59                           | 37                        | 3                          | 3                            | -- <sup>10</sup>          |
| South Hadley | 2                              | 133                          | 12                           | 5                         | 0                          | 0                            | 0                         |
| Southampton  | 0                              | 38                           | -- <sup>1</sup>              | 0                         | 1                          | 0                            | -- <sup>10</sup>          |

**Table 33 (cont.). Birth Characteristics: Occurrence and Resident Births and Infant Deaths, Massachusetts Municipalities: 2005**

| <b>Community</b> | <b>Occurrence Births<sup>2</sup></b> | <b>Resident Births<sup>3</sup></b> | <b>Low Birthweight<sup>4</sup></b> | <b>Teen Births (15-19 years)</b> | <b>Infant Deaths<sup>5</sup></b> | <b>Neonatal Deaths<sup>6</sup></b> | <b>Fetal Deaths<sup>7</sup></b> |
|------------------|--------------------------------------|------------------------------------|------------------------------------|----------------------------------|----------------------------------|------------------------------------|---------------------------------|
| Southborough     | 0                                    | 92                                 | 9                                  | -- <sup>8</sup>                  | 0                                | 0                                  | 0                               |
| Southbridge      | 425                                  | 241                                | 23                                 | 36                               | 4                                | 3                                  | -- <sup>10</sup>                |
| Southwick        | 0                                    | 94                                 | 10                                 | -- <sup>8</sup>                  | 1                                | 1                                  | 0                               |
| Spencer          | 0                                    | 163                                | 12                                 | 11                               | 0                                | 0                                  | -- <sup>10</sup>                |
| Springfield      | 5,537                                | 2,369                              | 231                                | 435                              | 25                               | 19                                 | 22                              |
| Sterling         | 0                                    | 76                                 | 8                                  | -- <sup>8</sup>                  | 0                                | 0                                  | 0                               |
| Stockbridge      | 0                                    | 11                                 | -- <sup>1</sup>                    | 0                                | 0                                | 0                                  | 0                               |
| Stoneham         | 1                                    | 216                                | 12                                 | 5                                | 1                                | 1                                  | 5                               |
| Stoughton        | 0                                    | 283                                | 30                                 | 10                               | 1                                | 0                                  | -- <sup>10</sup>                |
| Stow             | 1                                    | 77                                 | -- <sup>1</sup>                    | 0                                | 0                                | 0                                  | -- <sup>10</sup>                |
| Sturbridge       | 1                                    | 82                                 | -- <sup>1</sup>                    | -- <sup>8</sup>                  | 0                                | 0                                  | -- <sup>10</sup>                |
| Sudbury          | 0                                    | 201                                | 15                                 | -- <sup>8</sup>                  | 0                                | 0                                  | 0                               |
| Sunderland       | 2                                    | 26                                 | -- <sup>1</sup>                    | 0                                | 0                                | 0                                  | 0                               |
| Sutton           | 0                                    | 89                                 | 5                                  | -- <sup>8</sup>                  | 0                                | 0                                  | -- <sup>10</sup>                |
| Swampscott       | 1                                    | 145                                | -- <sup>1</sup>                    | -- <sup>8</sup>                  | 1                                | 0                                  | 0                               |
| Swansea          | 0                                    | 129                                | -- <sup>1</sup>                    | 6                                | 1                                | 1                                  | 0                               |
| Taunton          | 471                                  | 737                                | 70                                 | 53                               | 6                                | 3                                  | 6                               |
| Templeton        | 1                                    | 63                                 | -- <sup>1</sup>                    | -- <sup>8</sup>                  | 0                                | 0                                  | 0                               |
| Tewksbury        | 0                                    | 310                                | 19                                 | 12                               | 1                                | 1                                  | -- <sup>10</sup>                |
| Tisbury          | 0                                    | 36                                 | -- <sup>1</sup>                    | -- <sup>8</sup>                  | 0                                | 0                                  | 0                               |
| Tolland          | 0                                    | 3                                  | 0                                  | 0                                | 0                                | 0                                  | 0                               |
| Topsfield        | 0                                    | 52                                 | -- <sup>1</sup>                    | 0                                | 0                                | 0                                  | 0                               |
| Townsend         | 0                                    | 73                                 | 6                                  | -- <sup>8</sup>                  | 2                                | 1                                  | -- <sup>10</sup>                |
| Truro            | 0                                    | 10                                 | 0                                  | -- <sup>8</sup>                  | 0                                | 0                                  | 0                               |
| Tyngsborough     | 1                                    | 122                                | 7                                  | -- <sup>8</sup>                  | 2                                | 1                                  | 0                               |
| Tyringham        | 0                                    | 1                                  | NA <sup>9</sup>                    | NA <sup>9</sup>                  | 0                                | 0                                  | 0                               |
| Upton            | 0                                    | 93                                 | 10                                 | 0                                | 0                                | 0                                  | -- <sup>10</sup>                |
| Uxbridge         | 0                                    | 162                                | 15                                 | -- <sup>8</sup>                  | 1                                | 1                                  | -- <sup>10</sup>                |
| Wakefield        | 1                                    | 297                                | 10                                 | 0                                | 0                                | 0                                  | -- <sup>10</sup>                |
| Wales            | 0                                    | 18                                 | -- <sup>1</sup>                    | -- <sup>8</sup>                  | 0                                | 0                                  | 0                               |
| Walpole          | 0                                    | 310                                | 10                                 | 5                                | 0                                | 0                                  | 0                               |
| Waltham          | 2                                    | 733                                | 58                                 | 22                               | 0                                | 0                                  | 5                               |
| Ware             | 188                                  | 120                                | 7                                  | 13                               | 0                                | 0                                  | 0                               |
| Wareham          | 497                                  | 254                                | 18                                 | 18                               | 0                                | 0                                  | -- <sup>10</sup>                |
| Warren           | 0                                    | 69                                 | 7                                  | 8                                | 2                                | 2                                  | 0                               |
| Warwick          | 0                                    | 5                                  | 0                                  | 0                                | 0                                | 0                                  | 0                               |
| Washington       | 0                                    | 5                                  | 0                                  | 0                                | 0                                | 0                                  | 0                               |
| Watertown        | 0                                    | 392                                | 33                                 | -- <sup>8</sup>                  | 2                                | 2                                  | 0                               |
| Wayland          | 0                                    | 105                                | -- <sup>1</sup>                    | -- <sup>8</sup>                  | 0                                | 0                                  | 0                               |
| Webster          | 2                                    | 207                                | 18                                 | 16                               | 1                                | 1                                  | -- <sup>10</sup>                |
| Wellesley        | 74                                   | 260                                | 12                                 | 0                                | 0                                | 0                                  | 0                               |
| Wellfleet        | 0                                    | 14                                 | -- <sup>1</sup>                    | 0                                | 0                                | 0                                  | 0                               |
| Wendell          | 0                                    | 9                                  | -- <sup>1</sup>                    | 0                                | 0                                | 0                                  | 0                               |
| Wenham           | 0                                    | 32                                 | -- <sup>1</sup>                    | 0                                | 0                                | 0                                  | 0                               |
| West Boylston    | 0                                    | 52                                 | -- <sup>1</sup>                    | -- <sup>8</sup>                  | 0                                | 0                                  | 0                               |
| West Bridgewater | 0                                    | 73                                 | -- <sup>1</sup>                    | -- <sup>8</sup>                  | 0                                | 0                                  | 0                               |

**Table 33 (cont.). Birth Characteristics: Occurrence and Resident Births and Infant Deaths, Massachusetts Municipalities: 2005**

| Community        | Occurrence Births <sup>2</sup> | Resident Births <sup>3</sup> | Low Birthweight <sup>4</sup> | Teen Births (15-19 years) | Infant Deaths <sup>5</sup> | Neonatal Deaths <sup>6</sup> | Fetal Deaths <sup>7</sup> |
|------------------|--------------------------------|------------------------------|------------------------------|---------------------------|----------------------------|------------------------------|---------------------------|
| West Brookfield  | 0                              | 35                           | 0                            | -- <sup>8</sup>           | 0                          | 0                            | 0                         |
| West Newbury     | 0                              | 42                           | -- <sup>1</sup>              | 0                         | 1                          | 1                            | 0                         |
| West Springfield | 0                              | 336                          | 33                           | 20                        | 4                          | 4                            | 0                         |
| West Stockbridge | 0                              | 8                            | 0                            | 0                         | 0                          | 0                            | 0                         |
| West Tisbury     | 0                              | 30                           | -- <sup>1</sup>              | 0                         | 0                          | 0                            | 0                         |
| Westborough      | 0                              | 210                          | 13                           | -- <sup>8</sup>           | 1                          | 1                            | -- <sup>10</sup>          |
| Westfield        | 2                              | 433                          | 27                           | 24                        | 1                          | 1                            | -- <sup>10</sup>          |
| Westford         | 2                              | 246                          | 20                           | 0                         | 0                          | 0                            | -- <sup>10</sup>          |
| Westhampton      | 0                              | 13                           | 0                            | 0                         | 0                          | 0                            | 0                         |
| Westminster      | 0                              | 72                           | -- <sup>1</sup>              | 5                         | 0                          | 0                            | 0                         |
| Weston           | 0                              | 75                           | 5                            | 0                         | 0                          | 0                            | -- <sup>10</sup>          |
| Westport         | 1                              | 137                          | 7                            | 8                         | 1                          | 1                            | 0                         |
| Westwood         | 0                              | 136                          | 9                            | -- <sup>8</sup>           | 0                          | 0                            | 0                         |
| Weymouth         | 3,793                          | 701                          | 54                           | 22                        | 6                          | 5                            | 0                         |
| Whately          | 0                              | 14                           | 0                            | 0                         | 0                          | 0                            | 0                         |
| Whitman          | 0                              | 196                          | 19                           | 6                         | 1                          | 0                            | 0                         |
| Wilbraham        | 0                              | 92                           | -- <sup>1</sup>              | -- <sup>8</sup>           | 0                          | 0                            | 0                         |
| Williamsburg     | 1                              | 27                           | -- <sup>1</sup>              | -- <sup>8</sup>           | 0                          | 0                            | -- <sup>10</sup>          |
| Williamstown     | 1                              | 49                           | -- <sup>1</sup>              | -- <sup>8</sup>           | 0                          | 0                            | 0                         |
| Wilmington       | 0                              | 252                          | 16                           | -- <sup>8</sup>           | 0                          | 0                            | -- <sup>10</sup>          |
| Winchendon       | 0                              | 121                          | 8                            | 12                        | 0                          | 0                            | -- <sup>10</sup>          |
| Winchester       | 2,081                          | 236                          | 15                           | -- <sup>8</sup>           | 0                          | 0                            | 0                         |
| Windsor          | 0                              | 7                            | -- <sup>1</sup>              | 0                         | 0                          | 0                            | 0                         |
| Winthrop         | 0                              | 186                          | 23                           | -- <sup>8</sup>           | 1                          | 0                            | -- <sup>10</sup>          |
| Woburn           | 0                              | 457                          | 38                           | 18                        | 1                          | 0                            | -- <sup>10</sup>          |
| Worcester        | 6,239                          | 2,589                        | 215                          | 262                       | 36                         | 30                           | 20                        |
| Worthington      | 0                              | 10                           | 0                            | 0                         | 0                          | 0                            | 0                         |
| Wrentham         | 2                              | 129                          | 14                           | -- <sup>8</sup>           | 1                          | 0                            | -- <sup>10</sup>          |
| Yarmouth         | 0                              | 216                          | 12                           | 7                         | 0                          | 0                            | 0                         |
| Unknown          | 0                              | 0                            | 0                            | 0                         | 0                          | 0                            | -- <sup>10</sup>          |

-- Due to small numbers for births (n=1-4), exact count not provided.

1. Values of 1-4 for medical characteristics of communities with less than 200 births are suppressed based on Guidelines for Release of Birth Data, Ctr. for Health Information, Statistics, Research and Evaluation, Massachusetts Department of Public Health. 2. Births occurring in a geographical place (state, city/town) regardless of the residency of the mother. See Glossary for more details. 3. Births to mothers who report their usual place of residence as a particular geographical place (state, or city/town). See Glossary for more details. 4. Less than 2,500 grams (5.5 lbs.). 5. Death of a child whose age is less than one year. 6. Death of a child whose age is less than 28 days. 7. A stillbirth delivered, extracted or expelled at 20 weeks gestation or more or weighs 350 grams or more. 8. Births between 1 and 4 are suppressed. 9. Birth characteristics for towns with 1 birth not published. 10. When the number of fetal deaths is between 1 and 4, it is suppressed.



**Table 34. Birth Characteristics: Occurrence and Resident Births and Infant Deaths by County  
Massachusetts: 2005**

| County             | Occurrence<br>Births <sup>1</sup> | Resident Births <sup>2</sup> |                                 |                              | Deaths                        |                                 |                              |
|--------------------|-----------------------------------|------------------------------|---------------------------------|------------------------------|-------------------------------|---------------------------------|------------------------------|
|                    |                                   | Number                       | Low<br>Birthweight <sup>3</sup> | Teen Births<br>(15-19 years) | Infant<br>Deaths <sup>4</sup> | Neonatal<br>Deaths <sup>5</sup> | Fetal<br>Deaths <sup>6</sup> |
| <b>STATE TOTAL</b> | <b>77,841</b>                     | <b>76,824</b>                | <b>6,073</b>                    | <b>4,539</b>                 | <b>391</b>                    | <b>282</b>                      | <b>422</b>                   |
| Barnstable         | 1,654                             | 1,982                        | 132                             | 113                          | 8                             | 2                               | 7                            |
| Berkshire          | 1,237                             | 1,277                        | 109                             | 130                          | 3                             | 3                               | 8                            |
| Bristol            | 4,812                             | 6,540                        | 534                             | 489                          | 38                            | 21                              | 28                           |
| Dukes              | 153                               | 174                          | 6                               | -- <sup>7</sup>              | 1                             | 0                               | 0                            |
| Essex              | 7,856                             | 9,114                        | 692                             | 584                          | 36                            | 28                              | 37                           |
| Franklin           | 478                               | 666                          | 41                              | 42                           | 4                             | 3                               | -- <sup>8</sup>              |
| Hampden            | 6,164                             | 5,696                        | 478                             | 748                          | 39                            | 29                              | 37                           |
| Hampshire          | 1,038                             | 1,190                        | 95                              | 59                           | 5                             | 3                               | 5                            |
| Middlesex          | 15,418                            | 17,578                       | 1,283                           | 574                          | 76                            | 57                              | 82                           |
| Nantucket          | 117                               | 155                          | 10                              | 5                            | 0                             | 0                               | -- <sup>8</sup>              |
| Norfolk            | 4,445                             | 7,600                        | 548                             | 172                          | 35                            | 23                              | 32                           |
| Plymouth           | 3,470                             | 5,993                        | 531                             | 302                          | 28                            | 20                              | 40                           |
| Suffolk            | 21,674                            | 9,031                        | 868                             | 693                          | 52                            | 41                              | 68                           |
| Worcester          | 9,325                             | 9,828                        | 746                             | 624                          | 66                            | 52                              | 70                           |

1. Births occurring in a geographical place (state, city/town) regardless of the residency of the mother. See Glossary for more details. 2. Births to mothers who report their usual place of residence as a particular geographical place (state, or city/town). See Glossary for more details. 3. Less than 2,500 grams (5.5 lbs.). 4. Death of a child whose age is less than one year. 5. Death of a child whose age is less than 28 days. 6. A stillbirth delivered, extracted or expelled at 20 weeks gestation or more or weighs 350 grams or more. 7. Births between 1 and 4 are suppressed. 8. When the number of fetal deaths is between 1 and 4, it is suppressed.

**Table 35. Birth Characteristics, Occurrence and Resident Births and Infant Deaths, Massachusetts Community Health Network Areas (CHNAs), Massachusetts: 2005**

| Community Health Network Area                                  | Occurrence Births <sup>1</sup> | Resident Births <sup>2</sup> |                  |                           | Deaths              |                       |                    |
|--|--------------------------------|------------------------------|------------------|---------------------------|---------------------|-----------------------|--------------------|
|  |                                | Number                       | LBW <sup>3</sup> | Teen Births (15-19 years) | Infant <sup>4</sup> | Neonatal <sup>5</sup> | Fetal <sup>6</sup> |
| <b>STATE TOTAL</b>   | <b>77,841</b>                  | <b>76,824</b>                | <b>6,073</b>     | <b>4,539</b>              | <b>391</b>          | <b>282</b>            | <b>422</b>         |
| Community Health Network of Berkshire County                   | 1,237                          | 1,277                        | 109              | 130                       | 3                   | 3                     | 8                  |
| Upper Valley Health Web (Franklin County)                      | 480                            | 844                          | 56               | 58                        | 4                   | 3                     | 5                  |
| Partnership for Health in Hampshire County (Northampton)       | 1,038                          | 1,172                        | 94               | 59                        | 5                   | 3                     | -- <sup>7</sup>    |
| The Community Health Connection (Springfield)                  | 5,540                          | 3,754                        | 335              | 493                       | 32                  | 25                    | 25                 |
| Community Health Network of Southern Worcester County          | 429                            | 1,415                        | 109              | 109                       | 8                   | 7                     | 12                 |
| Community Partners for Health (Milford)                        | 921                            | 2,109                        | 151              | 57                        | 9                   | 8                     | 17                 |
| Community Health Network of Greater Metro West (Framingham)    | 2,036                          | 4,939                        | 345              | 113                       | 21                  | 15                    | 17                 |
| Community Wellness Coalition (Worcester)                       | 6,247                          | 4,005                        | 307              | 294                       | 38                  | 32                    | 26                 |
| Fitchburg/Gardner Community Health Network                     | 1,730                          | 3,003                        | 225              | 184                       | 17                  | 11                    | 19                 |
| Greater Lowell Community Health Network                        | 2,548                          | 3,592                        | 297              | 252                       | 19                  | 10                    | 16                 |
| Greater Lawrence Community Health Network                      | 3,066                          | 2,724                        | 214              | 260                       | 17                  | 13                    | 7                  |
| Greater Haverhill Community Health Network                     | 713                            | 1,773                        | 137              | 97                        | 8                   | 6                     | 6                  |
| Community Health Network North (Beverly/Gloucester)            | 2,156                          | 1,189                        | 81               | 26                        | 0                   | 0                     | -- <sup>7</sup>    |
| North Shore Community Health Network                           | 1,921                          | 3,428                        | 260              | 201                       | 11                  | 9                     | 22                 |
| Greater Woburn/Concord/Littleton Community Health Network      | 3,258                          | 2,094                        | 144              | 39                        | 8                   | 6                     | 11                 |
| North Suburban Health Alliance (Medford/Malden/Melrose)        | 1,277                          | 3,233                        | 226              | 81                        | 17                  | 15                    | 19                 |
| Greater Cambridge/Somerville Community Health Network          | 3,112                          | 3,137                        | 225              | 64                        | 9                   | 7                     | 13                 |
| West Suburban Health Network (Newton/Waltham)                  | 3,265                          | 2,582                        | 165              | 35                        | 4                   | 3                     | 11                 |
| Alliance for Community Health (Boston/Chelsea/Revere/Winthrop) | 21,677                         | 9,644                        | 905              | 695                       | 56                  | 44                    | 71                 |
| Blue Hills Community Health Alliance (Greater Quincy)          | 4,362                          | 4,341                        | 331              | 122                       | 24                  | 16                    | 18                 |
| Four (For) Communities (Holyoke, Chicopee, Ludlow, Westfield)  | 624                            | 1,888                        | 140              | 250                       | 7                   | 4                     | 12                 |
| Greater Brockton Community Health Network                      | 2,343                          | 3,107                        | 319              | 187                       | 14                  | 10                    | 22                 |
| South Shore Community Partners in Prevention (Plymouth)        | 627                            | 2,126                        | 165              | 76                        | 12                  | 8                     | 15                 |
| Greater Attleboro-Taunton Health & Education Response          | 1,552                          | 3,178                        | 249              | 149                       | 12                  | 8                     | 14                 |
| Partners for a Healthier Community (Fall River)                | 1,649                          | 1,592                        | 110              | 160                       | 11                  | 5                     | -- <sup>7</sup>    |
| Greater New Bedford Health & Human Services Coalition          | 2,109                          | 2,367                        | 226              | 226                       | 16                  | 9                     | 14                 |
| Cape and Islands Community Health Network                      | 1,924                          | 2,311                        | 148              | 122                       | 9                   | 2                     | 8                  |

1. Births occurring in a geographical place (state, city/town) regardless of the residency of the mother. See Glossary for more details. 2. Births to mothers who report their usual place of residence as a particular geographical place (state, city/town). See Glossary for more details. 3. Less than 2,500 grams (5.5 lbs.). 4. Death of a child whose age is less than one year. 5. Death of a child whose age is less than 28 days. 6. A stillbirth delivered, extracted or expelled at 20 weeks gestation or more or weighs 350 grams or more. 7. When the number of fetal deaths is between 1 and 4, it is suppressed.

## TECHNICAL NOTES

### 1. DATA AVAILABILITY

This publication and other Department of Public Health publications and materials can be accessed on the Internet at:

<http://www.state.ma.us/dph/pubstats.htm>

Detailed information on 2005 births in Massachusetts, as well as access to other Department of Public Health data, is available on the Department's free, Internet-accessible data warehouse, **MassCHIP**. To register as a user, visit the MassCHIP website at <http://masschip.state.ma.us>, or call 1-888-MASCHIP (within MA only) or 617-624-5629.

### 2. DATA CAUTIONS

#### Limitations of small numbers:

Cells in some tables in this publication, and particularly those tables specific to the individual cities and towns, contain small numbers. Rates and proportions based on less than five observations are suppressed, and trends based upon small numbers should be interpreted cautiously.

#### Differences with previously published data

Numbers and rates in this publication may differ from those contained in previous reports because of updates of birth and death certificate files, or release of the most up-to-date population estimates for a given year (see Technical Note #4 for details on population files).

#### Self-reported data

Many items used in this publication, such as maternal smoking, education, and race/ethnicity are self-reported, and are subject to the usual limitations of this type of information.

### 3. CHANGES IN THE COLLECTION OF RACE AND ETHNICITY INFORMATION

#### Assignment of an Infant's Race/Ethnicity

Prior to 1989, the race/ethnicity of an infant was assigned by combining information on the race/ethnicity of the mother and the race/ethnicity of the father. Since 1989, Massachusetts has followed the recommendation of the National Center for Health Statistics of classifying births according to the self-reported race/ethnicity of the mother. Therefore, beginning in 1989, the race/ethnicity of an infant is identical to the self-reported race/ethnicity of the infant's mother.

#### Addition of Information on Hispanic Ethnicity

Beginning in 1986, an identifier for Hispanic ethnicity was added to the birth certificate; in 1989, an identifier for Hispanic ethnicity was added to the death certificate. Prior to these changes, most infants and mothers of Hispanic ethnicity were included with whites and it was not possible to accurately calculate Hispanic-specific rates of natality and mortality.

The ethnicity categories available on the Parent Worksheet for birth certificate are:

- Puerto Rican
- Dominican
- Mexican
- Cuban
- Colombian
- Salvadoran
- Other Central American
- Other South American
- Other Hispanic
- Chinese
- Vietnamese
- Cambodian
- Asian Indian
- Korean
- Filipino
- Japanese
- Laotian
- Pakistani
- Thai
- Hawaiian
- Other Asian/Pacific Islander
- Cape Verdean
- Brazilian
- Other Portuguese
- Haitian
- Jamaican
- Barbadian
- Other West Indian/Caribbean Islander
- African American
- Nigerian
- Other African
- Lebanese
- Iranian
- Israeli
- Other Middle Eastern
- Native American
- European
- American
- Other

#### 4. POPULATION ESTIMATES

We calculated the proportion of the county total that each Massachusetts city/town contributed by age, sex, five-race group from the MRACE file and applied those proportions to the 2005 MARS files to create the Massachusetts Modified Age Race Sex 2005 estimates (MMARS05) file.

The MRACE file was derived from the Census 2000 file by allocating persons who indicated “some other race” or multiple races to the conventional DPH race categories: “White”, “Black or African American”, “Asian,” “Native American,” and “Hispanic.” In Census 2000, unlike previous censuses, respondents were able to classify themselves by Hispanic ethnicity and by single or multi-race categories, including “some other race.” In order to make the DPH population 2000 file consistent with previous years’ population files, the MRACE file maintains the prior mutually exclusive race and Hispanic categories.

In this year’s report, we are using the most up-to-date population estimates for the calculation of population-based rates such as the teen birth rate. In the next paragraphs, the methods used in calculating these estimate are explained.

**Note: Population-based statistics presented in this report for the years 2000-2005 will differ from previous publications due to the use of new population estimates for these years.**

### MDPH Census Year 2000 Estimates

MDPH estimated the population for the years since the 2000 Census using the MDPH 2000 population estimates file, the Massachusetts Race Age Census Estimates (MRACE) file. The MRACE file is a modification of the Census 2000 population counts for Massachusetts. In Census 2000, respondents could select one or more races for the race question. The Census Bureau reported the results by single race and two or more races, for example, in Massachusetts, the race population counts were:

| Race   | Population |
|--|------------|
| Total:   | 6,349,097  |
| Population of one race:                          | 6,203,092  |
| White alone                                      | 5,367,286  |
| Black or African American alone                  | 343,454    |
| American Indian and Alaska Native alone          | 15,015     |
| Asian alone                                      | 238,124    |
| Native Hawaiian and Other Pacific Islander alone | 2,489      |
| Some other race alone                            | 236,724    |
| Population of two or more races:                 | 146,005    |
| Specific combinations...                         |            |

Source: Table P3. Census 2000 Summary File 1 (SF1).

Hispanic was considered an ethnicity, and not a race. Therefore, persons of any race could be Hispanic. This new Census reporting system made it difficult in Massachusetts to compare 2000 rates with previous years' rates in which there were five race categories: white non-Hispanic, black non-Hispanic, Asian non-Hispanic, American Indian non-Hispanic, and Hispanic. The MRACE file reallocated (also known as, "bridging") the "Some other race alone" and "Two or more race" persons to the traditional five race categories used at the Department. This was done using an algorithm developed by the Massachusetts Institute of Social and Economic Research (MISER), in which those populations were redistributed at the city/town level according to the proportion of single race populations.

### Postcensal Years

The MRACE file was used to calculate the population-based rates in the births reports from 2000 through 2004.

Every year the Population Estimates Program of the U.S. Census Bureau in collaboration with the National Center for Health Statistics (NCHS) produces bridged race files for the states and counties. These estimates are known as the Modified Age Race Sex (MARS) estimates. In

previous years, we have not used these estimates since they are not available at the city/town level.

### **Methodology for New MDPH 2000 - 2005 Population Estimates**

In the years since Census 2000, the distribution of Massachusetts residents has changed by age, race/ethnicity, and race. In 2006, because these changes were significant, MDPH decided to produce new population estimates by age, race/ethnicity, and sex at the city/town level.

These estimates were created using the city/town age, race/ethnicity, and sex proportions of their counties in the MRACE estimates and applying these to the MARS county estimates. The resulting estimates were called the Massachusetts Department of Public Health Modified Age, Race, & Sex 200x Estimates (MMARS0x), where x = year. Estimates were produced for 2000, 2001, 2002, 2003, 2004, and 2005.

The MMARS05 estimates were used to calculate the population-based rates in this year's report.

The MMARS00, MMARS01, MMARS02, MMARS03, and MMARS04 estimates were used to recalculate the population-based rates for births. **This means that trends from 2000-2005 presented in this report will differ from the previous years' reports.**

### **Population-based rates between 1991 and 1999 in this publication were calculated as follows:**

- 1991-1998: Massachusetts Institute for Social and Economic Research (MISER) Population Estimates;
- 1999: Massachusetts Dept. of Public Health 1999 Population Estimate, which is a linear interpolation between the preliminary DPH Population 2000 file and the MISER 1998 Population Estimate.

## **5. DEFINITION AND IDENTIFICATION OF PREGNANCY-ASSOCIATED AND MATERNAL DEATHS**

There are various ways to categorize a woman who dies during pregnancy, childbirth, or in the postpartum period. Two components are included in every definition of maternal death: (1) the timing of death in relation to the pregnancy and birth; and (2) the causes of death. Two definitions are used in this report: maternal death and pregnancy-associated death.

The traditional definition of maternal death can be found in the World Health Organization's *International Classification of Diseases* (ICD). WHO defines maternal deaths as women who died during pregnancy or within 42 days of delivery from causes related to pregnancy, childbirth or its management. Deaths from accidental or incidental causes are excluded. The National Center for Health Statistics uses the WHO definition to conduct surveillance on maternal death in the US. Maternal deaths are deaths of women whose underlying causes of death were coded with ICD-9 codes 630-676 (from 1990-1998), or with ICD-10 codes O00-O99 (1999 forward).

The definition of a pregnancy-associated death was developed in 1986 by the Maternal Mortality Study Group, which is jointly chaired by American College of Obstetrics and Gynecology (ACOG) and the Center for Disease Control and Prevention (CDC). Pregnancy-associated

deaths differ from maternal deaths in two fundamental ways: all deaths are included irrespective of cause, and deaths that occurred between 42 and 364 days after delivery also are included. Thus, maternal deaths are a subset of pregnancy-associated deaths.

## 6. CHANGE IN MEASUREMENT OF ADEQUACY OF PRENATAL CARE

Change in Adequacy of Prenatal Care Indicator since *Massachusetts Births 2001*:  
(This discussion is based on excerpts from “An Overview of the APNCU Index” by Milton Kotelchuck, Sept. 1994, available online at:  
[http://www.mchlibrary.info/databases/HSNRCPDFs/Overview\\_APCUIndex.pdf](http://www.mchlibrary.info/databases/HSNRCPDFs/Overview_APCUIndex.pdf). Accessed December 2003).

Beginning with *Massachusetts Births 2001*, adequacy of prenatal care is being measured using a new method. The Adequacy of Prenatal Care Utilization (APNCU) Index, developed by Dr. Milton Kotelchuck, has replaced the Kessner Index, which had been used in the *Advanced Data Births* and *Massachusetts Births* series. The APNCU Index is the standard used in Healthy People 2010 and by the majority of states. It improves upon the Kessner Index in various ways, the most important being the ability to distinguish between inadequate prenatal care due to the timing of initiation and inadequate care due to insufficient prenatal care visits. The APNCU Index also improves upon the Kessner Index by correcting some of its principal faults. First, the APNCU Index more accurately assesses adequacy of visits for term pregnancies; the Kessner Index characterizes 9 or more visits as adequate, due to an early computer database limitation, which only allowed for a single-digit number to record prenatal care visits. Other faults of the Kessner Index include its bias towards measurement of adequacy of initiation of care, and its various computational algorithms due to inadequate initial documentation.

Table 1 of this report provides a comparison of data on adequacy of prenatal care from 1996-2004 as measured by these two separate indices. Below are the definitions for the APNCU Index categories and its two component indices (initiation and received services), and the definition of the Kessner Index categories. Also below is a short summary of the major differences in classification of adequacy of prenatal care using the Kessner Index and the APNCU Index.

The APNCU Index characterizes prenatal care (PNC) utilization by measuring two distinct components of prenatal care -- adequacy of initiation and adequacy of received services (visits). Each of these components is measured as an independent index, and the APNCU Index is a summary of these 2 component indices. As with the Kessner Index, the APNCU Index does not assess quality of the prenatal care that is delivered, only its utilization.

### **Adequacy of Prenatal Care Utilization (APNCU) Index: Definition of Categories**

| Category           | Month Prenatal Care Began              | % of Expected <sup>1</sup> Prenatal Care Visits |
|--------------------|--|---|
| Adequate Intensive | 1, 2, 3, or 4                          | 110% or more                                    |
| Adequate Basic     | 1, 2, 3, or 4                          | 80 – 109%                                       |
| Intermediate       | 1, 2, 3, or 4                          | 50 – 79%  |
| Inadequate         | Month 5 or later                       | Less than 50%                                   |
| Unknown            | Prenatal care information not recorded |   |

## **Component Indices of the APNCU Index: Definitions of Categories**

### **Component Indices and Summary Index**

The first component index is "Adequacy of Initiation," which describes the adequacy of when prenatal care began during pregnancy. The assumption underlying this scale is that the earlier PNC begins the better. The month or trimester prenatal care begins is widely used as a measure to assess the adequacy of timing of initiation of PNC, since it accurately and succinctly describes when PNC begins. The APNCU Index uses this measure to determine the "adequacy of initiation."

The second component index, "Adequacy of Received Services" (visits), characterizes the adequacy of received PNC visits during the time period after prenatal care is begun until the delivery. This component attempts to characterize if the woman received the appropriate number of prenatal care visits for the time period in which she received PNC services. [The appropriate number of visits is based on recommendations of the American College of Obstetricians and Gynecologists for an uncomplicated pregnancy. For example, a woman beginning prenatal care during the first month of pregnancy who delivers during the 40th week of gestation (and has no complications with her pregnancy) should receive 14 visits].

The two component indices are measured independently from one another, and can be used as separate indices, since the policy and practice issues underlying whether women are beginning care early and whether they are receiving the recommended amount of visits may be quite distinct. However, because of the popularity and utility of using one overall adequacy of PNC index, the two component indices are combined into a single summary index – the "Adequacy of Prenatal Care Utilization (APNCU) Index."

### **Index Categories**

Both component indices and the summary index (APNCU Index) characterize PNC as one of five categories: "adequate intensive," "adequate basic," "intermediate," "inadequate," or "unknown." The category "adequate basic" refers to the minimum recommended level of care (for a pregnancy with no complications), while "adequate intensive" refers to a level of care exceeding recommended standards. The sum of the "adequate basic" and "adequate intensive" categories is the total adequacy score. In addition, the "inadequate" category can be subdivided to isolate those women who received no PNC. [For definitions of categories, please see the Technical Notes in the Appendix.]

[For more detail on the methodology of the APNCU Index, please call the Center for Health Information, Statistics, Research & Evaluation at 617-624-5600].



### Adequacy of Initiation Index

| Category           | Month Prenatal Care Began                         |
|--------------------|---|
| Adequate Intensive | 1 or 2  |
| Adequate Basic     | 3 or 4  |
| Intermediate       | 5 or 6  |
| Inadequate         | Month 7 or later, or no PNC                       |
| Unknown            | Prenatal care initiation information not recorded |

### Adequacy of Received Services (Visits) Index

| Category           | % of Expected Prenatal Care Visits               |
|--------------------|--|
| Adequate Intensive | 110% or more                                     |
| Adequate Basic     | 80 – 109%  |
| Intermediate       | 50 – 79%   |
| Inadequate         | Less than 50%                                    |
| Unknown            | Information on prenatal care visits not recorded |

### Kessner Index of Adequacy of Prenatal Care: Definition of Categories

| Category         | Trimester Care Began | Number of Visits |
|------------------|----------------------|------------------|
| Adequate         | 1                    | 9 or more        |
| Intermediate     | 1                    | 5-8              |
|                  | 2                    | 5 or more        |
| Inadequate       | 1                    | 1-4              |
|                  | 2                    | 1-4              |
|                  | 3                    | 1 or more        |
| No prenatal care | --                   | 0                |
| Unknown          | Unknown              | Unknown          |

**NOTE:** The number of “expected” visits is determined based on standards set by the American College of Obstetricians and Gynecologists (ACOG).

**Summary of Major Differences in Categorization of Adequacy of Prenatal Care between the Kessner Index and the APNCU Index**

The two different methods used in the Kessner Index and APNCU Index to calculate adequacy of prenatal care can result in differences in how each one classifies adequacy of prenatal care. These differences only occur under certain conditions, not in all cases (see "Explanation" column).

| The Kessner Index classifies prenatal care as... | ... but the APNCU Index classifies prenatal care as ... | Explanation  |
|--|---|--|
| Intermediate                                     | Adequate Basic  | This is primarily due to the fact that the APNCU Index allows for prenatal care in the 4 <sup>th</sup> month of pregnancy to be considered adequate if the mother received 80-109% of expected visits, whereas the Kessner Index only allows for care begun in the first trimester (months 1-3) to be considered adequate.   |
| Intermediate                                     | Inadequate  | This is primarily due to the fact that the APNCU categorizes any prenatal care beginning after month 4 as "inadequate" whereas the Kessner Index allows for care beginning in months 5 or 6 with 5 or more visits to be "intermediate."  |
| Adequate   | Intermediate  | This is primarily due to the consideration of "expected" visits (based on when the mother initiated care and the length of gestation) using the APNCU Index, which bases expected visits on the ACOG recommendations, which can be as high as 14 visits if a gestational period is 40 weeks, whereas the Kessner Index considers 9 visits sufficient in all cases. |
| Adequate   | Adequate Intensive                                      | The APNCU Index added an "Adequate Intensive" category, which is not used in the Kessner Index. This allows analysis of situations in which more than normal care is received (e.g. women with high risk conditions, pregnancy complications).   |

## Tests of Statistical Significance

Beginning with this year's report, statistics presented in the text section have been tested to determine whether they differ significantly from a target statistic. For example, the number of births in 2005 was compared with the number of births in 2004, to determine whether their difference was unlikely to have occurred by chance. When a difference is unlikely to have occurred by chance it is referred to as "significant."

**Note that with respect to statistical difference, the language of this year's report differs from the language of past reports, and caution must be used when comparing the text of previous reports with this year's report.**

In testing for statistical significance, we have used the testing methods from the National Center for Health Statistics (NCHS). These methods are presented in the following document:

National Vital Statistics Reports, Volume 52, Number 10

Births: Final Data for 2002

by Joyce A. Martin, M.P.H.; Brady E. Hamilton, Ph.D.; Paul D. Sutton, Ph.D.; Stephanie J. Ventura, M.A.; Fay Menacker, Dr. P.H.; and Martha L. Munson, M.S.;

From the Division of Vital Statistics, NCHS.

Technical Notes, "Significance testing" section beginning on page 110.

This document is available from the following website:

<http://www.cdc.gov/nchs/products/pubs/pubd/nvsr/52/52-23.htm>

For comparisons of more than 100 events, whether they are rates, proportions, or numbers, the binomial distribution is assumed, and confidence intervals are examined to see whether they overlap (Refer to the "Confidence Intervals and Infant Mortality Rates" section in this Appendix for an explanation of using confidence intervals to determine statistical significance.) When the number of events is less than 100, a Poisson distribution is assumed, and confidence intervals are constructed based upon the Poisson distribution. For more details and exact formulas for calculating confidence intervals or other tests of statistical significance, refer to the publication listed above.

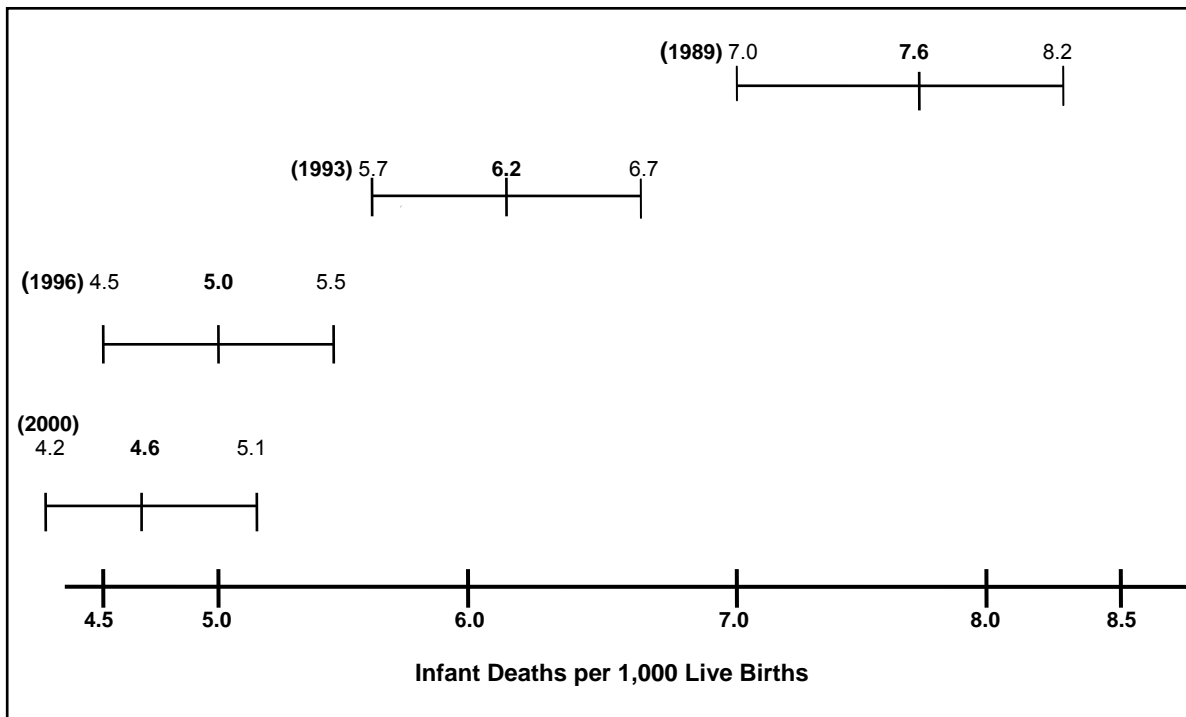
When two statistics are determined to differ significantly, then they are referred to in the text with language expressing differences, such as, "higher" and "lower", or "increased" and "decreased". Otherwise, differences which are not significant are reported as having "no change" or "no statistical difference."

## CONFIDENCE INTERVALS AND INFANT MORTALITY RATES

Beginning with the 1992 Advance Data: Births publication, 95% confidence intervals were added to the calculation of infant mortality rates (IMRs). The confidence interval (CI) provides a measure of stability of the IMR and a basis for comparing rates to determine if they are statistically different. Rates can be compared for the same group in different years, or for different groups in the same year. The width of the CI reflects the stability of the IMR. For example, a narrow CI reflects high stability, and a wide interval reflects low stability. If the CIs around two IMRs being compared do not overlap, the difference between the two rates is statistically significant. The following table and chart illustrate the concept of statistically significant differences using actual data from 1989, 1993, 1996, and 2000.

**Comparison of Infant Mortality Rates and Confidence Intervals for Selected Years**

| <u>Year</u> | <u>IMR (per 1,000 births)</u> | <u>95% Confidence Interval</u> |
|-------------|-------------------------------|--------------------------------|
| 1989        | 7.6                           | (7.0-8.2)                      |
| 1993        | 6.2                           | (5.7-6.7)                      |
| 1996        | 5.0                           | (4.5-5.5)                      |
| 2000        | 4.6                           | (4.2-5.1)                      |



The difference between the 1993 IMR and 1996 IMR is statistically significant – the confidence intervals do not overlap. The same is true for the differences between the 1989 IMR and each annual IMR for 1993, 1996, and 2000. However, the difference between the 1996 and 2000 IMRs is not statistically significant, since their confidence intervals overlap.

**Table 36. 95% Confidence Intervals for Infant Mortality Rates, by Race and Hispanic Ethnicity, Massachusetts: 1990-2005**

| Year        | <u>Total<sup>1</sup></u> |                            | <u>White non-Hispanic</u> |                            | <u>Black non-Hispanic</u> |                            | <u>Hispanic</u> |                            | <u>Asian</u> |                            |
|-------------|--------------------------|----------------------------|---------------------------|----------------------------|---------------------------|----------------------------|-----------------|----------------------------|--------------|----------------------------|
|             | n                        | Rate <sup>2</sup> (95% CI) | n                         | Rate <sup>2</sup> (95% CI) | n                         | Rate <sup>2</sup> (95% CI) | n               | Rate <sup>2</sup> (95% CI) | n            | Rate <sup>2</sup> (95% CI) |
| 1990        | 649                      | 7.0 (6.5, 7.5)             | 442                       | 6.1 (5.5, 6.7)             | 98                        | 13.7 (11.0, 16.4)          | 77              | 9.1 (7.1, 11.1)            | 24           | 7.0 (4.2, 10.0)            |
| 1991        | 577                      | 6.5 (6.0, 7.0)             | 381                       | 5.5 (4.9, 6.1)             | 101                       | 15.0 (12.1, 17.9)          | 80              | 9.4 (7.3, 11.5)            | 14           | 4.2 (2.0, 6.4)             |
| 1992        | 569                      | 6.5 (6.0, 7.0)             | 371                       | 5.5 (4.9, 6.1)             | 110                       | 16.4 (13.4, 19.4)          | 67              | 7.9 (6.0, 9.8)             | 16           | 4.9 (2.5, 7.3)             |
| 1993        | 523                      | 6.2 (5.7, 6.7)             | 346                       | 5.3 (4.7, 5.9)             | 84                        | 13.1 (10.3, 15.9)          | 77              | 9.3 (7.2, 11.4)            | 13           | 3.9 (1.8, 6.0)             |
| 1994        | 499                      | 6.0 (5.4, 6.5)             | 343                       | 5.3 (4.7, 5.9)             | 79                        | 12.6 (9.8, 15.4)           | 64              | 7.6 (5.7, 9.4)             | 8            | 2.4 (0.7, 4.0)             |
| 1995        | 419                      | 5.1 (4.6, 5.6)             | 275                       | 4.4 (3.8, 4.9)             | 65                        | 11.1 (8.4, 13.8)           | 58              | 7.2 (5.3, 9.0)             | 19           | 5.5 (3.0, 8.0)             |
| 1996        | 403                      | 5.0 (4.5, 5.5)             | 289                       | 4.7 (4.1, 5.2)             | 63                        | 11.4 (8.6, 14.2)           | 40              | 5.1 (3.5, 6.7)             | 8            | 2.2 (0.7, 3.7)             |
| 1997        | 425                      | 5.3 (4.8, 5.8)             | 294                       | 4.8 (4.2, 5.3)             | 64                        | 11.7 (8.8, 14.5)           | 55              | 6.7 (4.9, 8.4)             | 10           | 2.6 (1.0, 4.2)             |
| 1998        | 414                      | 5.1 (4.6, 5.6)             | 294                       | 4.6 (4.1, 5.2)             | 64                        | 10.6 (7.9, 13.3)           | 55              | 6.7 (5.0, 8.4)             | 10           | 2.7 (1.0, 4.3)             |
| 1999        | 418                      | 5.2 (4.7, 5.7)             | 285                       | 4.7 (4.2, 5.3)             | 72                        | 12.3 (9.5, 15.1)           | 49              | 5.5 (4.0, 7.1)             | 8            | 1.9 (0.6, 3.3)             |
| 2000        | 377                      | 4.6 (4.2, 5.1)             | 232                       | 3.8 (3.4, 4.3)             | 74                        | 12.8 (9.9, 15.7)           | 48              | 5.2 (3.7, 6.6)             | 19           | 4.1 (2.2, 5.9)             |
| 2001        | 407                      | 5.0 (4.5, 5.5)             | 245                       | 4.1 (3.6, 4.7)             | 71                        | 12.1 (9.3, 14.9)           | 69              | 7.3 (5.6, 9.1)             | 15           | 3.1 (1.6, 4.7)             |
| 2002        | 397                      | 4.9 (4.4, 5.4)             | 239                       | 4.1 (3.6, 4.6)             | 69                        | 11.6 (8.9, 14.3)           | 67              | 7.0 (5.3, 8.7)             | 16           | 3.0 (1.5, 4.5)             |
| 2003        | 383                      | 4.8 (4.3, 5.3)             | 235                       | 4.1 (3.6, 4.6)             | 75                        | 12.7 (9.8, 15.5)           | 55              | 5.6 (4.1, 7.1)             | 14           | 2.7 (1.3, 4.1)             |
| 2004        | 376                      | 4.7 (4.3, 5.3)             | 210                       | 3.8 (3.3, 4.3)             | 70                        | 11.5 (8.9, 14.2)           | 75              | 7.6 (5.9, 9.4)             | 15           | 2.7 (1.4, 4.1)             |
| <b>2005</b> | <b>391</b>               | <b>5.1 (4.6, 5.6)</b>      | <b>230</b>                | <b>4.3 (3.7, 4.9)</b>      | <b>57</b>                 | <b>9.4 (7.0, 11.8)</b>     | <b>78</b>       | <b>7.8 (6.0, 9.5)</b>      | <b>18</b>    | <b>3.4 (1.8, 5.0)</b>      |

1. Deaths of infants of unknown race are excluded except for the total calculation. For rate computations, births of infants of unknown race are allocated into the race categories according to the distribution of births of known race. 2. Rates are expressed per 1,000 live births.

In 2005, the black non-Hispanic infant mortality rate was 9.4 deaths per 1,000 live births (95% CI: 7.0, 11.8), which was two times greater than the white non-Hispanic infant mortality rate of 4.3 (95% CI: 3.7, 4.9). The difference in these two rates was statistically significant. The rate of infant mortality for black non-Hispanics was also significantly elevated compared with Asians (95% CI: 1.8, 5.0) in 2005.

## DEFINITION OF RATES AND RATIOS

### Age-Specific Birth Rate

The number of children born to women in a specific age group divided by the population of women in that specific age group, multiplied by 1,000.

$$\text{Age-Specific Birth Rate} = \frac{\text{Number of births to females ages X to Y years}}{\text{Number of females ages X to Y years in the population}} \times 1,000$$

### Birth Rate

(See Age-Specific Birth Rate, Crude Birth Rate, Fertility Rate, and Teen Birth Rate)

### Cesarean Section Rates

$$\text{Total C-section Rate} = \frac{\text{Number of C-section births}}{\text{Number of occurrence births}} \times 100$$

$$\text{Primary C-section Rate} = \frac{\text{Number of primary C-section births}}{[\text{Number of occurrence births} - (\text{number of repeat C-section births} + \text{VBACs})]} \times 100$$

$$\text{Repeat C-section Rate} = \frac{\text{Number of repeat C-section births}}{(\text{Number of repeat C-section births} + \text{number of VBACs})} \times 100$$

$$\text{VBAC Rate} = \frac{\text{Number of VBACs}}{(\text{Number of repeat C-section births} + \text{number of VBACs})} \times 100$$

### Crude Birth Rate

$$\text{Crude Birth Rate} = \frac{\text{Number of resident live births}}{\text{Total resident population}} \times 1,000$$

### Fertility Rate (sometimes referred to as "Birth Rate")

$$\text{Fertility Rate} = \frac{\text{Number of births to females ages 15-44 years}}{\text{Number of females ages 15-44 years in the population}} \times 1,000$$

### Fetal Mortality Rate

$$\text{Fetal Mortality Rate} = \frac{\text{Number of fetal deaths}}{\text{Number of fetal deaths plus live births in the same year}} \times 1,000$$

### Feto-Infant Mortality Rate

$$\text{Feto-Infant Mortality Rate} = \frac{\text{Number of fetal deaths} + \text{Number of infant deaths}}{\text{Number of fetal deaths} + \text{live births in the same year}} \times 1,000$$

(Refer to the definitions of Fetal Mortality Rate and Infant Mortality Rate for more details.)

### Infant Mortality Rate (IMR)

The death rate among infants less than one year old per 1,000 live births.

$$\text{Infant Mortality Rate} = \frac{\text{Number of resident deaths of infants less than one year old in a year}}{\text{Number of resident live births in the same year}} \times 1,000$$

### Inter-pregnancy Interval (IPI)

Inter-pregnancy interval is the time, in months, between the date of last menstrual period of current pregnancy and the date of previous live birth. IPI is calculated for each mother currently giving birth to their second or later child.

$$\% \text{Short IPI} = \frac{\text{Number of mothers giving birth to their 2}^{\text{nd}} \text{ or later child with IPI} < 12 \text{ months}}{\text{Number of mothers giving birth to their 2}^{\text{nd}} \text{ or later child in the same year}} \times 100$$

$$\% \text{ IPI } 12 \text{ to } 35 \text{ months} = \frac{\text{Number of mothers giving birth to their 2}^{\text{nd}} \text{ or later child with IPI between 12 and 35 months}}{\text{Number of mothers giving birth to their 2}^{\text{nd}} \text{ or later child in the same year}} \times 100$$

$$\% \text{ IPI } 36+ \text{ months} = \frac{\text{Number of mothers giving birth to their 2}^{\text{nd}} \text{ or later child with IPI } \geq 36 \text{ months}}{\text{Number of mothers giving birth to their 2}^{\text{nd}} \text{ or later child in the same year}} \times 100$$

### Maternal Mortality Ratio (MMR)

The number of maternal deaths per 100,000 live occurrence births. The term "ratio" is used instead of "rate" in this report because the numerator includes some maternal deaths that were not related to live-born infants and thus were not included in the denominator.

$$\text{Maternal Mortality Ratio (MMR)} = \frac{\text{Number of maternal deaths}}{\text{Number of occurrence live births in the same year}} \times 100,000$$

### Neonatal Mortality Rate (NMR)

The death rate among infants less than 28 days of age per 1,000 live births.

$$\text{Neonatal Mortality Rate} = \frac{\text{Number of resident deaths of infants less than 28 days of age in a year}}{\text{Number of resident live births in the same year}} \times 1,000$$

### Perinatal Mortality Rate

$$\text{Perinatal Mortality Rate} = \frac{\text{Number of fetal deaths from 28 weeks gestation plus infant deaths (less than 7 days old)}}{\text{Number of fetal deaths plus live births in the same year}} \times 1,000$$

### Post Neonatal Mortality Rate

The death rate among infants 28 days of age to less than one year old per 1,000 live births.

$$\text{Post Neonatal Mortality Rate} = \frac{\text{Number of resident deaths of infants 28 days of age to less than one year of age in a year}}{\text{Number of resident live births in the same year}} \times 1,000$$

### Pregnancy-Associated Mortality Ratio (PAMR)

The number of pregnancy-associated deaths per 100,000 live occurrence births. The term "ratio" is used instead of rate in this report because the numerator includes some maternal deaths that were not related to live-born infants and thus were not included in the denominator.

$$\text{Pregnancy-Associated Mortality Ratio (PAMR)} = \frac{\text{Number of pregnancy-associated deaths}}{\text{Number of occurrence live births in the same year}} \times 100,000$$

### Teen Birth Rate

$$\text{Teen birth rate} = \frac{\text{Number of births to females ages 15-19 years old}}{\text{Number of females ages 15-19 years old in the population}} \times 1,000$$

### Total Rate of Change

Total rate of change between two numbers or rates is expressed as a percentage in this report (e.g. The Massachusetts birth rate decreased by 12% from 1990 to 1996.):

$$\frac{P_n - P_o}{P_o} \times 100$$

where,  $P_n$  = rate during later time period  
 $P_o$  = rate during earlier time period



**Table A1. Population Estimates<sup>1</sup> for Massachusetts Communities: 2005**

| TOWN NAME           | COUNTY     | CHNA | POPULATION | TOWN NAME        | COUNTY     | CHNA | POPULATION |
|---------------------|------------|------|------------|------------------|------------|------|------------|
| Abington            | Plymouth   | 22   | 16,305     | Concord          | Middlesex  | 15   | 16,858     |
| Acton               | Middlesex  | 15   | 20,539     | Conway           | Franklin   | 2    | 1,902      |
| Acushnet            | Bristol    | 26   | 10,535     | Cummington       | Hampshire  | 3    | 986        |
| Adams               | Berkshire  | 1    | 8,456      | Dalton           | Berkshire  | 1    | 6,697      |
| Agawam              | Hampden    | 4    | 28,547     | Danvers          | Essex      | 14   | 25,999     |
| Alford              | Berkshire  | 1    | 400        | Dartmouth        | Bristol    | 26   | 31,371     |
| Amesbury            | Essex      | 12   | 16,617     | Dedham           | Norfolk    | 18   | 23,681     |
| Amherst             | Hampshire  | 3    | 34,721     | Deerfield        | Franklin   | 2    | 4,786      |
| Andover             | Essex      | 11   | 32,838     | Dennis           | Barnstable | 27   | 15,914     |
| Aquinnah (Gay Head) | Dukes      | 27   | 362        | Dighton          | Bristol    | 24   | 6,648      |
| Arlington           | Middlesex  | 17   | 41,273     | Douglas          | Worcester  | 6    | 7,861      |
| Ashburnham          | Worcester  | 9    | 5,970      | Dover            | Norfolk    | 18   | 5,634      |
| Ashby               | Middlesex  | 9    | 2,926      | Dracut           | Middlesex  | 10   | 28,805     |
| Ashfield            | Franklin   | 2    | 1,824      | Dudley           | Worcester  | 5    | 10,787     |
| Ashland             | Middlesex  | 7    | 15,431     | Dunstable        | Middlesex  | 10   | 3,142      |
| Athol               | Worcester  | 2    | 11,690     | Duxbury          | Plymouth   | 23   | 14,655     |
| Attleboro           | Bristol    | 24   | 43,364     | East Bridgewater | Plymouth   | 22   | 13,832     |
| Auburn              | Worcester  | 8    | 16,393     | East Brookfield  | Worcester  | 5    | 2,111      |
| Avon                | Norfolk    | 22   | 4,345      | East Longmeadow  | Hampden    | 4    | 14,845     |
| Ayer                | Middlesex  | 9    | 7,212      | Eastham          | Barnstable | 27   | 5,550      |
| Barnstable          | Barnstable | 27   | 47,902     | Easthampton      | Hampshire  | 3    | 15,994     |
| Barre               | Worcester  | 9    | 5,375      | Easton           | Bristol    | 22   | 22,995     |
| Becket              | Berkshire  | 1    | 1,783      | Edgartown        | Dukes      | 27   | 3,934      |
| Bedford             | Middlesex  | 15   | 12,486     | Egremont         | Berkshire  | 1    | 1,355      |
| Belchertown         | Hampshire  | 3    | 13,897     | Erving           | Franklin   | 2    | 1,542      |
| Bellingham          | Norfolk    | 6    | 15,735     | Essex            | Essex      | 13   | 3,342      |
| Belmont             | Middlesex  | 17   | 23,453     | Everett          | Middlesex  | 16   | 37,100     |
| Berkley             | Bristol    | 24   | 6,352      | Fairhaven        | Bristol    | 26   | 16,223     |
| Berlin              | Worcester  | 9    | 2,683      | Fall River       | Bristol    | 25   | 92,117     |
| Bernardston         | Franklin   | 2    | 2,237      | Falmouth         | Barnstable | 27   | 33,620     |
| Beverly             | Essex      | 13   | 39,833     | Fitchburg        | Worcester  | 9    | 40,514     |
| Billerica           | Middlesex  | 10   | 39,812     | Florida          | Berkshire  | 1    | 666        |
| Blackstone          | Worcester  | 6    | 9,051      | Foxborough       | Norfolk    | 7    | 16,288     |
| Blandford           | Hampden    | 4    | 1,266      | Frammingham      | Middlesex  | 7    | 65,651     |
| Bolton              | Worcester  | 9    | 4,428      | Franklin         | Norfolk    | 6    | 30,748     |
| Boston              | Suffolk    | 19   | 558,435    | Freetown         | Bristol    | 26   | 8,963      |
| Bourne              | Barnstable | 27   | 19,355     | Gardner          | Worcester  | 9    | 20,955     |
| Boxborough          | Middlesex  | 15   | 5,032      | Georgetown       | Essex      | 12   | 8,023      |
| Boxford             | Essex      | 12   | 8,162      | Gill             | Franklin   | 2    | 1,392      |
| Boylston            | Worcester  | 8    | 4,253      | Gloucester       | Essex      | 13   | 30,671     |
| Braintree           | Norfolk    | 20   | 33,658     | Goshen           | Hampshire  | 3    | 956        |
| Brewster            | Barnstable | 27   | 10,242     | Gosnold          | Dukes      | 27   | 86         |
| Bridgewater         | Plymouth   | 22   | 25,769     | Grafton          | Worcester  | 8    | 16,783     |
| Brimfield           | Hampden    | 5    | 3,627      | Granby           | Hampshire  | 3    | 6,332      |
| Brockton            | Plymouth   | 22   | 100,366    | Granville        | Hampden    | 4    | 1,644      |
| Brookfield          | Worcester  | 5    | 3,096      | Great Barrington | Berkshire  | 1    | 7,440      |
| Brookline           | Norfolk    | 19   | 56,422     | Greenfield       | Franklin   | 2    | 17,888     |
| Buckland            | Franklin   | 2    | 1,995      | Groton           | Middlesex  | 9    | 10,396     |
| Burlington          | Middlesex  | 15   | 23,265     | Groveland        | Essex      | 12   | 6,591      |
| Cambridge           | Middlesex  | 17   | 101,529    | Hadley           | Hampshire  | 3    | 4,820      |
| Canton              | Norfolk    | 20   | 21,481     | Halifax          | Plymouth   | 23   | 7,805      |
| Carlisle            | Middlesex  | 15   | 4,823      | Hamilton         | Essex      | 13   | 8,334      |
| Carver              | Plymouth   | 23   | 11,552     | Hampden          | Hampden    | 4    | 5,312      |
| Charlemont          | Franklin   | 2    | 1,387      | Hancock          | Berkshire  | 1    | 1,018      |
| Charlton            | Worcester  | 5    | 12,447     | Hanover          | Plymouth   | 23   | 14,077     |
| Chatham             | Barnstable | 27   | 6,833      | Hanson           | Plymouth   | 23   | 9,915      |
| Chelmsford          | Middlesex  | 10   | 33,728     | Hardwick         | Worcester  | 9    | 2,655      |
| Chelsea             | Suffolk    | 19   | 34,128     | Harvard          | Worcester  | 9    | 6,116      |
| Cheshire            | Berkshire  | 1    | 3,356      | Harwich          | Barnstable | 27   | 12,673     |
| Chester             | Hampden    | 21   | 1,320      | Hatfield         | Hampshire  | 3    | 3,280      |
| Chesterfield        | Hampshire  | 3    | 1,271      | Haverhill        | Essex      | 12   | 60,032     |
| Chicopee            | Hampden    | 21   | 54,599     | Hawley           | Franklin   | 2    | 345        |
| Chilmark            | Dukes      | 27   | 944        | Heath            | Franklin   | 2    | 805        |
| Clarksburg          | Berkshire  | 1    | 1,663      | Hingham          | Plymouth   | 20   | 21,470     |
| Clinton             | Worcester  | 9    | 13,997     | Hinsdale         | Berkshire  | 1    | 1,811      |
| Cohasset            | Norfolk    | 20   | 7,219      | Holbrook         | Norfolk    | 22   | 10,765     |
| Colrain             | Franklin   | 2    | 1,858      | Holden           | Worcester  | 8    | 16,571     |

**Table A1 (cont.). Population Estimates<sup>1</sup> for Massachusetts Communities: 2005**

| TOWN NAME      | COUNTY     | CHNA | POPULATION | TOWN NAME        | COUNTY     | CHNA | POPULATION |
|----------------|------------|------|------------|------------------|------------|------|------------|
| Holland        | Hampden    | 5    | 2,529      | New Marlborough  | Berkshire  | 1    | 1,522      |
| Holliston      | Middlesex  | 7    | 13,830     | New Salem        | Franklin   | 2    | 986        |
| Holyoke        | Hampden    | 21   | 41,089     | Newbury          | Essex      | 12   | 6,990      |
| Hopedale       | Worcester  | 6    | 6,234      | Newburyport      | Essex      | 12   | 17,395     |
| Hopkinton      | Middlesex  | 7    | 14,048     | Newton           | Middlesex  | 18   | 83,346     |
| Hubbardston    | Worcester  | 9    | 4,340      | Norfolk          | Norfolk    | 7    | 10,506     |
| Hudson         | Middlesex  | 7    | 18,847     | North Adams      | Berkshire  | 1    | 14,031     |
| Hull           | Plymouth   | 20   | 11,279     | North Andover    | Essex      | 11   | 27,137     |
| Huntington     | Hampshire  | 21   | 2,180      | North Attleboro  | Bristol    | 24   | 28,078     |
| Ipswich        | Essex      | 13   | 13,285     | North Brookfield | Worcester  | 5    | 4,812      |
| Kingston       | Plymouth   | 23   | 12,435     | North Reading    | Middlesex  | 16   | 13,930     |
| Lakeville      | Plymouth   | 24   | 10,618     | Northampton      | Hampshire  | 3    | 28,803     |
| Lancaster      | Worcester  | 9    | 7,069      | Northborough     | Worcester  | 7    | 14,652     |
| Lanesborough   | Berkshire  | 1    | 2,951      | Northbridge      | Worcester  | 6    | 14,184     |
| Lawrence       | Essex      | 11   | 81,591     | Northfield       | Franklin   | 2    | 3,226      |
| Lee            | Berkshire  | 1    | 5,882      | Norton           | Bristol    | 24   | 19,106     |
| Leicester      | Worcester  | 8    | 10,953     | Norwell          | Plymouth   | 20   | 10,382     |
| Lenox          | Berkshire  | 1    | 5,149      | Norwood          | Norfolk    | 20   | 28,472     |
| Leominster     | Worcester  | 9    | 42,120     | Oak Bluffs       | Dukes      | 27   | 3,794      |
| Leverett       | Franklin   | 2    | 1,769      | Oakham           | Worcester  | 9    | 1,892      |
| Lexington      | Middlesex  | 15   | 30,452     | Orange           | Franklin   | 2    | 7,659      |
| Leyden         | Franklin   | 2    | 815        | Orleans          | Barnstable | 27   | 6,459      |
| Lincoln        | Middlesex  | 15   | 7,935      | Otis             | Berkshire  | 1    | 1,391      |
| Littleton      | Middlesex  | 15   | 8,561      | Oxford           | Worcester  | 5    | 13,710     |
| Longmeadow     | Hampden    | 4    | 15,556     | Palmer           | Hampden    | 4    | 12,895     |
| Lowell         | Middlesex  | 10   | 105,749    | Paxton           | Worcester  | 8    | 4,556      |
| Ludlow         | Hampden    | 21   | 21,835     | Peabody          | Essex      | 14   | 50,954     |
| Lunenburg      | Worcester  | 9    | 10,008     | Pelham           | Hampshire  | 3    | 1,415      |
| Lynn           | Essex      | 14   | 92,186     | Pembroke         | Plymouth   | 23   | 18,069     |
| Lynnfield      | Essex      | 14   | 11,540     | Pepperell        | Middlesex  | 9    | 11,386     |
| Malden         | Middlesex  | 16   | 56,730     | Peru             | Berkshire  | 1    | 836        |
| Manchester     | Essex      | 13   | 5,332      | Petersham        | Worcester  | 2    | 1,282      |
| Mansfield      | Bristol    | 24   | 22,933     | Phillipston      | Worcester  | 2    | 1,753      |
| Marblehead     | Essex      | 14   | 20,285     | Pittsfield       | Berkshire  | 1    | 43,949     |
| Marion         | Plymouth   | 26   | 5,316      | Plainfield       | Hampshire  | 3    | 600        |
| Marlborough    | Middlesex  | 7    | 37,163     | Plainville       | Norfolk    | 7    | 7,994      |
| Marshfield     | Plymouth   | 23   | 24,879     | Plymouth         | Plymouth   | 23   | 54,781     |
| Mashpee        | Barnstable | 27   | 14,159     | Plympton         | Plymouth   | 23   | 2,777      |
| Mattapoisett   | Plymouth   | 26   | 6,477      | Princeton        | Worcester  | 9    | 3,520      |
| Maynard        | Middlesex  | 7    | 10,221     | Provincetown     | Barnstable | 27   | 3,444      |
| Medfield       | Norfolk    | 7    | 12,328     | Quincy           | Norfolk    | 20   | 90,458     |
| Medford        | Middlesex  | 16   | 53,801     | Randolph         | Norfolk    | 20   | 32,552     |
| Medway         | Norfolk    | 6    | 12,780     | Raynham          | Bristol    | 24   | 13,428     |
| Melrose        | Middlesex  | 16   | 26,366     | Reading          | Middlesex  | 16   | 23,161     |
| Mendon         | Worcester  | 6    | 5,743      | Rehoboth         | Bristol    | 24   | 11,229     |
| Merrimac       | Essex      | 12   | 6,350      | Revere           | Suffolk    | 19   | 45,551     |
| Methuen        | Essex      | 11   | 44,532     | Richmond         | Berkshire  | 1    | 1,618      |
| Middleborough  | Plymouth   | 24   | 21,153     | Rochester        | Plymouth   | 26   | 5,295      |
| Middlefield    | Hampshire  | 3    | 549        | Rockland         | Plymouth   | 23   | 17,842     |
| Middleton      | Essex      | 11   | 9,077      | Rockport         | Essex      | 13   | 7,761      |
| Milford        | Worcester  | 6    | 27,523     | Rowe             | Franklin   | 2    | 350        |
| Millbury       | Worcester  | 8    | 13,443     | Rowley           | Essex      | 12   | 5,832      |
| Millis         | Norfolk    | 7    | 7,949      | Royalston        | Worcester  | 2    | 1,366      |
| Millville      | Worcester  | 6    | 2,938      | Russell          | Hampden    | 4    | 1,723      |
| Milton         | Norfolk    | 20   | 26,243     | Rutland          | Worcester  | 9    | 7,406      |
| Monroe         | Franklin   | 2    | 100        | Salem            | Essex      | 14   | 41,647     |
| Monson         | Hampden    | 4    | 8,744      | Salisbury        | Essex      | 12   | 8,264      |
| Montague       | Franklin   | 2    | 8,416      | Sandisfield      | Berkshire  | 1    | 830        |
| Monterey       | Berkshire  | 1    | 959        | Sandwich         | Barnstable | 27   | 20,707     |
| Montgomery     | Hampden    | 4    | 743        | Saugus           | Essex      | 14   | 26,867     |
| Mt. Washington | Berkshire  | 1    | 135        | Savoy            | Berkshire  | 1    | 724        |
| Nahant         | Essex      | 14   | 3,591      | Scituate         | Plymouth   | 20   | 18,119     |
| Nantucket      | Nantucket  | 27   | 10,095     | Seekonk          | Bristol    | 24   | 13,660     |
| Natick         | Middlesex  | 7    | 31,895     | Sharon           | Norfolk    | 20   | 17,269     |
| Needham        | Norfolk    | 18   | 28,445     | Sheffield        | Berkshire  | 1    | 3,360      |
| New Ashford    | Berkshire  | 1    | 247        | Shelburne        | Franklin   | 2    | 2,054      |
| New Bedford    | Bristol    | 26   | 94,502     | Sherborn         | Middlesex  | 7    | 4,220      |
| New Braintree  | Worcester  | 9    | 1,090      | Shirley          | Middlesex  | 9    | 7,361      |

**Table A1 (cont.). Population Estimates<sup>1</sup> for Massachusetts Communities: 2005**

| TOWN NAME    | COUNTY     | CHNA | POPULATION | TOWN NAME        | COUNTY     | CHNA | POPULATION |
|--------------|------------|------|------------|------------------|------------|------|------------|
| Shrewsbury   | Worcester  | 8    | 33,171     | Warwick          | Franklin   | 2    | 763        |
| Shutesbury   | Franklin   | 2    | 1,843      | Washington       | Berkshire  | 1    | 546        |
| Somerset     | Bristol    | 25   | 18,564     | Watertown        | Middlesex  | 17   | 32,255     |
| Somerville   | Middlesex  | 17   | 75,372     | Wayland          | Middlesex  | 7    | 13,015     |
| South Hadley | Hampshire  | 3    | 17,071     | Webster          | Worcester  | 5    | 16,853     |
| Southampton  | Hampshire  | 3    | 5,828      | Wellesley        | Norfolk    | 18   | 26,975     |
| Southborough | Worcester  | 7    | 9,511      | Wellfleet        | Barnstable | 27   | 2,821      |
| Southbridge  | Worcester  | 5    | 17,503     | Wendell          | Franklin   | 2    | 1,035      |
| Southwick    | Hampden    | 4    | 9,512      | Wenham           | Essex      | 13   | 4,643      |
| Spencer      | Worcester  | 5    | 12,087     | West Boylston    | Worcester  | 8    | 7,708      |
| Springfield  | Hampden    | 4    | 156,358    | West Bridgewater | Plymouth   | 22   | 6,819      |
| Sterling     | Worcester  | 9    | 7,761      | West Brookfield  | Worcester  | 5    | 3,896      |
| Stockbridge  | Berkshire  | 1    | 2,256      | West Newbury     | Essex      | 12   | 4,301      |
| Stoneham     | Middlesex  | 16   | 21,594     | West Springfield | Hampden    | 4    | 27,938     |
| Stoughton    | Norfolk    | 22   | 26,782     | West Stockbridge | Berkshire  | 1    | 1,450      |
| Stow         | Middlesex  | 7    | 6,159      | West Tisbury     | Dukes      | 27   | 2,666      |
| Sturbridge   | Worcester  | 5    | 8,825      | Westborough      | Worcester  | 7    | 18,781     |
| Sudbury      | Middlesex  | 7    | 17,035     | Westfield        | Hampden    | 21   | 40,432     |
| Sunderland   | Franklin   | 2    | 3,853      | Westford         | Middlesex  | 10   | 21,369     |
| Sutton       | Worcester  | 6    | 8,974      | Westhampton      | Hampshire  | 3    | 1,566      |
| Swampscott   | Essex      | 14   | 14,283     | Westminster      | Worcester  | 9    | 7,358      |
| Swansea      | Bristol    | 25   | 16,243     | Weston           | Middlesex  | 18   | 11,591     |
| Taunton      | Bristol    | 24   | 56,348     | Westport         | Bristol    | 25   | 15,053     |
| Templeton    | Worcester  | 9    | 7,474      | Westwood         | Norfolk    | 18   | 13,902     |
| Tewksbury    | Middlesex  | 10   | 28,990     | Weymouth         | Norfolk    | 20   | 53,708     |
| Tisbury      | Dukes      | 27   | 3,819      | Whately          | Franklin   | 2    | 1,584      |
| Tolland      | Hampden    | 4    | 446        | Whitman          | Plymouth   | 22   | 14,424     |
| Topsfield    | Essex      | 13   | 6,178      | Wilbraham        | Hampden    | 4    | 13,960     |
| Townsend     | Middlesex  | 9    | 9,273      | Williamsburg     | Hampshire  | 3    | 2,433      |
| Truro        | Barnstable | 27   | 2,162      | Williamstown     | Berkshire  | 1    | 8,276      |
| Tyngsborough | Middlesex  | 10   | 11,297     | Wilmington       | Middlesex  | 15   | 21,431     |
| Tyringham    | Berkshire  | 1    | 352        | Winchendon       | Worcester  | 9    | 10,085     |
| Upton        | Worcester  | 6    | 6,374      | Winchester       | Middlesex  | 15   | 21,139     |
| Uxbridge     | Worcester  | 6    | 12,377     | Windsor          | Berkshire  | 1    | 858        |
| Wakefield    | Middlesex  | 16   | 24,553     | Winthrop         | Suffolk    | 19   | 17,067     |
| Wales        | Hampden    | 5    | 1,818      | Woburn           | Middlesex  | 15   | 37,074     |
| Walpole      | Norfolk    | 7    | 23,067     | Worcester        | Worcester  | 8    | 179,839    |
| Waltham      | Middlesex  | 18   | 59,564     | Worthington      | Hampshire  | 3    | 1,291      |
| Ware         | Hampshire  | 3    | 9,988      | Wrentham         | Norfolk    | 7    | 11,066     |
| Wareham      | Plymouth   | 26   | 21,274     | Yarmouth         | Barnstable | 27   | 24,663     |
| Warren       | Worcester  | 5    | 5,040      |                  |            |      |            |

1. Massachusetts (Department of Public Health) Modified Age, Race/Ethnicity, & Sex Estimates 2005 (MMARS05), released October, 2006.

**Table A2. Population Estimates<sup>1</sup> for Massachusetts Community Health Network Areas (CHNA) and Counties: 2005**

| CHNA   | POPULATION | COUNTY       | POPULATION       |
|--|------------|--------------|------------------|
| 1. Community Health Network of Berkshire County                    | 131,965    | Barnstable   | 226,505          |
| 2. Upper Valley Health Web (Franklin County)                       | 88,506     | Berkshire    | 131,965          |
| 3. Partnership for Health in Hampshire County (Northampton)        | 151,801    | Bristol      | 547,711          |
| 4. The Community Health Connection (Springfield)                   | 299,490    | Dukes        | 15,605           |
| 5. Community Health Network of Southern Worcester County           | 119,141    | Essex        | 750,463          |
| 6. Community Partners for Health (Milford)                         | 160,521    | Franklin     | 72,415           |
| 7. Community Health Network of Greater Metro West (Framingham)     | 379,658    | Hampden      | 466,739          |
| 8. Community Wellness Coalition (Worcester)                        | 303,669    | Hampshire    | 153,981          |
| 9. Fitchburg/Gardner Community Health Network                      | 261,369    | Middlesex    | 1,464,179        |
| 10. Greater Lowell Community Health Network                        | 272,893    | Nantucket    | 10,095           |
| 11. Greater Lawrence Community Health Network                      | 195,176    | Norfolk      | 656,472          |
| 12. Greater Haverhill Community Health Network                     | 148,557    | Plymouth     | 497,687          |
| 13. Community Health Network North (Beverly/Gloucester)            | 119,378    | Suffolk      | 655,181          |
| 14. North Shore Community Health Network                           | 287,352    | Worcester    | 787,943          |
| 15. Greater Woburn/Concord/Littleton Community Health Network      | 209,597    |              |                  |
| 16. North Suburban Health Alliance (Medford/Malden/Melrose)        | 257,235    | <b>STATE</b> | <b>6,436,940</b> |
| 17. Greater Cambridge/Somerville Community Health Network          | 273,883    |              |                  |
| 18. West Suburban Health Network (Newton/Waltham)                  | 253,138    |              |                  |
| 19. Alliance for Community Health (Boston/Chelsea/Revere/Winthrop) | 711,603    |              |                  |
| 20. Blue Hills Community Health Alliance (Greater Quincy)          | 372,309    |              |                  |
| 21. Four (For) Communities (Holyoke, Chicopee, Ludlow, Westfield)  | 161,454    |              |                  |
| 22. Greater Brockton Community Health Network                      | 242,404    |              |                  |
| 23. South Shore Community Partners in Prevention (Plymouth)        | 188,787    |              |                  |
| 24. Greater Attleboro-Taunton Health & Education Response          | 252,919    |              |                  |
| 25. Partners for a Healthier Community (Fall River)                | 141,977    |              |                  |
| 26. Greater New Bedford Health & Human Services Coalition          | 199,955    |              |                  |
| 27. Cape and Islands Community Health Network                      | 252,204    |              |                  |

1. Massachusetts (Department of Public Health) Modified Age, Race/Ethnicity, & Sex Estimates 2005 (MMARS05), released October, 2006.

## GLOSSARY

### Adequacy of Prenatal Care Utilization (APNCU) Index

The Adequacy of Prenatal Care Utilization Index, developed by Dr. Milton Kotelchuck, is the measure used in this publication to classify the adequacy of prenatal care received by Massachusetts resident mothers. (*Please note: Prior to the *Births 2001* publication, the Kessner Index was used to measure adequacy of prenatal care; please see definition for Kessner Index below.*) The APNCU Index has five categories (adequate intensive, adequate basic, intermediate, inadequate, and unknown), based on the month of pregnancy in which prenatal care begins and the percent of expected prenatal care visits for the time period during which a woman receives prenatal care services. Please see Technical Notes for more details.

### Birthweight

The weight of an infant recorded at the time of delivery. It may be recorded in either pounds/ounces or grams. If recorded in pounds/ounces, it is converted to grams for use in this report.

1 pound = 453.6 grams

1,000 grams = 2 pounds and 3 ounces

### Birthweight Categories

Normal birthweight (NBW): An infant's weight of 2,500 grams (approximately 5.5 pounds) or more recorded at birth.

Low birthweight (LBW): An infant's weight of less than 2,500 grams (5.5 pounds) recorded at birth.

Very low birthweight (VLBW): An infant's weight of less than 1,500 grams (3.3 pounds) recorded at birth.

### Cesarean Section or C-Section

Primary: A mother's first Cesarean section delivery.

Repeat: A Cesarean delivery that has been preceded by at least one Cesarean delivery.

### Community Health Network Areas (CHNAs)

The Department of Public Health, in collaboration with health service providers, coalition members, and interested citizens, has designated 27 areas for community health planning. It is the Department's intention to foster in each of these areas the development of Community Health Networks – consortia of health care providers, human service agencies, schools, churches, youth, parents, elders, advocacy groups, and individual consumers – to address the health needs of the community. These community coalitions will participate in monitoring outcomes and progress of strategies and responses to those health needs.

It is hoped the Networks will mobilize around key health issues impacting the community, promote prevention efforts, enhance access to care, provide opportunities for more collaboration among agencies, and create a client-centered, outcome-oriented health service delivery system. Community Health Networks will also promote efficiency in service delivery by working to reduce duplication and overlap, and by identifying gaps in service.

A Community Health Network Area (CHNA) is defined as an aggregation of cities and towns. In

the current publication, we have presented some data by CHNA. To determine which cities and towns make up a particular CHNA, Table A1 provides the appropriate CHNA code for each city and town. The data published in this volume reflect the definitions of CHNAs instituted in January 1997 and the corresponding CHNA names.

#### Confidence Intervals

The confidence interval (CI) for the infant mortality rate (IMR) is a range of values that has a 95% chance of including the underlying risk of an infant death. Observed rates are subject to statistical variation; even if the underlying risk of infant death is identical in two subpopulations, the observed IMRs for the subpopulations may differ because of random variation. The confidence interval describes the precision of observed IMR as an estimate of the underlying risk of infant death, with a wider interval indicating less certainty about this estimate. The width of the interval reflects the size of the subpopulation and the number of infant deaths; smaller subpopulations with fewer infant deaths lead to wider confidence intervals.

#### Death Cohort Linked File or Linked Birth and Infant Death File – Death Cohort

All infant deaths occurring in a specific year have been linked to their corresponding birth certificates, whether the birth occurred during the same year or in the previous one. This is in contrast to a birth cohort linked file, in which infant deaths may have occurred in the same year as, or in the year following the year of birth.

#### Delivery

A delivery may consist of one or more live born or stillborn fetuses. The number of deliveries in a given period will be equal to or less than the number of births because multiple births (twins, triplets or higher-order births) are counted as single deliveries.

#### EOHHS Regions

The six regions delineated by the commonwealth's Executive Office of Health and Human Services and used by the Department of Public Health for statistical, care coordination and administrative purposes. The regions - Western, Central, Northeast, Metro West, Boston and Southeast - are based on geographical groupings of cities and towns.

#### Ethnicity

See the section in the Technical Notes of the Appendix entitled: "Changes in the Collection of Race and Ethnicity Information."

#### Fetal Death

A stillbirth delivered, extracted or expelled at 20 weeks gestation or more or weighs 350 grams or more.

#### Feto-Infant Mortality Rate

The combined number of fetal deaths and infant deaths per 1000 live births and fetal deaths.

#### Healthy Start

A Massachusetts-funded program providing services and financing for prenatal care to low-income pregnant women who lack health insurance, but do not qualify for Medicaid.

#### Infant

A child whose age is less than one year (365 days).

### Infant Death

Death of a child whose age is less than one year.

### Kessner Index (Adequacy of Prenatal Care)

A measure of adequacy of prenatal care, used in *Advance Data: Births* and *Massachusetts Births* publications prior to 2001. The Kessner Index classifies prenatal care as one of 5 categories (adequate, intermediate, inadequate, no prenatal care, and unknown), based on the trimester in which prenatal care began and the number of prenatal visits. The classification adjusts for gestational age to allow for proper classification of premature births, and is as follows:

| Category         | Trimester Care Began | Number of Visits |
|------------------|----------------------|------------------|
| Adequate         | 1                    | 9 or more        |
| Intermediate     | 1                    | 5-8              |
|                  | 2                    | 5 or more        |
|                  | 1                    | 1-4              |
| Inadequate       | 2                    | 1-4              |
|                  | 3                    | 1 or more        |
| No prenatal care | --                   | 0                |
| Unknown          | Unknown              | Unknown          |

### Live Birth

A live birth is any infant who breathes or shows any other evidence of life (such as beating of the heart, pulsation of the umbilical cord, or definite movement of voluntary muscles) after separation from the mother's uterus, regardless of the duration of gestation.

### Low Birthweight (LBW)

See Birthweight Categories.

### Maternal Death

The death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration or site of the pregnancy, from any cause related to or aggravated by pregnancy or its management, but not from accidental or incidental causes.

### Mother's Birthplace

In this publication, birth characteristics are presented according to mother's birthplace: those who were born in the 50 states and District of Columbia, or "U.S. States / D.C."; those who were born in Puerto Rico, the US Virgin Islands, and Guam, or "Puerto Rico/U.S. Territories"; and those who were born outside of the U.S. and Puerto Rico/U.S. territories, or "Non-U.S.-Born".

### Neonatal

Infants under 28 days of age.

### Neonatal Death

Death of a child whose age is less than 28 days.

### Non-U.S.-Born Women

See Mother's Birthplace.

#### Occurrence Birth

A birth occurring in the Commonwealth of Massachusetts, regardless of the residency of the mother. For individual cities/towns, an occurrence birth represents any birth occurring in that city/town, regardless of the residence of the mother. See Resident Birth.

#### Parity

The total number of live infants ever born to a woman, including the current birth.

#### Perinatal

Referring to the time period immediately before and after birth (28 weeks of gestation to 7 days after birth).

#### Perinatal Death

Death to a fetus of 28 weeks gestation or older or a live-born infant less than 7 days old.

#### Plurality

The number of births to a woman produced in the same gestational period. A singleton is the birth of one infant; twins represent the births of two infants, etc.

#### Post Neonatal

A child whose age is at least 28 days, but less than one year.

#### Post Neonatal Death

Death of a child whose age is at least 28 days, but less than one year.

#### Prenatal Care Source of Payment

Categories used in this publication include:

*Public* = Government programs including Commonwealth, Healthy Start, Medicaid/MassHealth, and Medicare (may be HMO or managed care), or free care;

*Private* = Commercial indemnity plan, commercial managed care (HMO, PPO, IPP, IPA, and other), or other private insurance;

*Other* = Worker's Compensation and other sources;

*Self-paid*.

#### Pregnancy-Associated Death

The death of a woman while pregnant or within one year of termination of pregnancy, irrespective of cause.

#### Race

See the section in the Technical Notes in the Appendix entitled: "Changes in the Collection of Race and Ethnicity Information."

#### Resident Birth

The birth of an infant whose mother reports that her usual place of residence is in Massachusetts. In Massachusetts, a resident is a person with a permanent address in one of the 351 cities or towns. Vital statistics data may be presented in terms either of residence or occurrence. All data in this publication are resident data unless otherwise stated. Resident data include all events that occur to residents of the Commonwealth, wherever they occur. Occurrence data include all events that occur within the state, whether to residents or nonresidents. There is an exchange agreement among the 50 states, District of Columbia,



Puerto Rico, Virgin Islands, Guam, and Canadian provinces that provides for exchange of copies of birth and death records. These records are used for statistical purposes only, and allow each state or province to track the births and deaths of its residents.

Vaginal Birth After Cesarean (VBAC)

A vaginal delivery of an infant to a mother who has had at least one prior Cesarean section delivery.

Very Low Birthweight (VLBW)

An infant's weight of less than 1,500 grams (3.3 pounds) recorded at birth.

# Massachusetts Birth Certificate: 2005

1129-1007-8208 ©1998, Moore Document Solutions. All rights reserved. - 0305  
Visit the Moore Internet Address: www.moore.com

USE ONLY STATE APPROVED RIBBONS AND MASS. STANDARD INK  
AS REQUIRED BY GEN. LAWS, CHAP. 66, SECT. 4



The Commonwealth of Massachusetts  
DEPARTMENT OF PUBLIC HEALTH  
REGISTRY OF VITAL RECORDS AND STATISTICS  
STANDARD CERTIFICATE OF LIVE BIRTH

STATE USE ONLY

|   |   |  |   |   |   |                                       |                            |
|---|---|--|---|---|---|---------------------------------------|----------------------------|
| 1. RECORD NUMBER<br><br><b>768283</b><br>1A. CERTIFICATE NUMBER<br>(DPH USE ONLY) | C<br>H<br>I<br>L<br>D                               | 3C. CITY/TOWN  | 3B. COUNTY  |   | 3A. FACILITY NAME-IF NOT IN FACILITY, NUMBER AND STREET |                                       | 3D. REGISTERED NUMBER      |
| 2. FACILITY NUMBER  |   | 5. SEX   | 6A. PLURALITY   | 6B. BIRTH ORDER                         | 7. TIME   | 8. DATE OF BIRTH (Month, Day, Year)   |                            |
| 22A. SOCIAL SECURITY CARD   | C<br>E<br>R<br>T<br>I<br>F<br>I<br>C<br>A<br>T<br>E | 9A. NAME   | 9C. CERTIFIER TYPE  |   | 9E. NUMBER AND STREET                                   |                                       | 9H. ZIP CODE               |
|   |   | NAME 10A. FIRST  | 10B. MIDDLE   | 10C. LAST                               | 10D. BIRTH ORDER  | 10E. DATE OF BIRTH (Month, Day, Year) |                            |
| INITIALS  | M<br>O<br>T<br>H<br>E<br>R                          | 11A. CITY/TOWN   |   | 11B. STATE/COUNTRY                      |   | 12. DATE OF BIRTH (Month, Day, Year)  |                            |
| 22B. RESIDENT COPY  |   | 13A. NUMBER AND STREET   |   | 13B. CITY/TOWN                          | 13C. COUNTY   | 13D. STATE                            | 13E. ZIP CODE              |
| INITIALS  | F<br>A<br>T<br>H<br>E<br>R                          | 14A. FIRST   |   | 14B. MIDDLE                             | 14C. LAST   |                                       |                            |
|   |   | 15A. CITY/TOWN   |   | 15B. STATE/COUNTRY                      |   | 16. DATE OF BIRTH (Month, Day, Year)  |                            |
| 1. OCCURRENCE   | I<br>N<br>F<br>O<br>R<br>M<br>A<br>N<br>T           | 17A. I (WE) CERTIFY THAT THE PERSONAL INFORMATION APPEARING ABOVE IS TRUE AND CORRECT. |   |   |   |                                       | 17B. RELATIONSHIP TO CHILD |
|   |   | 17C. DATE SIGNED (Month, Day, Year)  | 17D. MAILING ADDRESS<br>(If different from item # 13 above) |   | NUMBER AND STREET                                       | CITY                                  | STATE                      |
| 1. OCCURRENCE   | C<br>E<br>R<br>K                                    | 18. DATE OF RECORD (Month, Day, Year)  |   | 19. SUPPLEMENT FILED (Month, Day, Year) |   | 20. CLERK/REGISTRAR                   |                            |
|   |   | 21. DPH USE ONLY   |   |   |   |                                       |                            |



## **Massachusetts Births 2005 Evaluation Form**

### **TO OUR READERS:**

In an attempt to better serve our users, we are enclosing this evaluation form. Please take the time to complete this questionnaire and return it to the address at the bottom of the page. Thank you.

**What tables and charts do you find most useful?**

**What tables and charts do you find least useful?**

**Are there other tables and charts that you would like added to this publication?  
If yes, please describe them in detail.**

**Do you have other comments or suggestions?**

**Name (optional):**

**Address:**

**(For those who received the publication by mail)** Is the mailing label address correct?  
If not, please correct the address. Thank you.

**Please return your comments to:**

Dr. James K. West

Division of Research and Epidemiology

Ctr. for Health Information, Statistics, Research and Evaluation

Massachusetts Department of Public Health

250 Washington Street, 6th floor, Boston, MA 02108

---

**Place  
stamp  
here**

Dr. James K. West  
Division of Research and Epidemiology  
Ctr. for Health Information, Statistics, Research & Evaluation  
Massachusetts Department of Public Health  
250 Washington Street, 6th floor  
Boston, MA 02108

---

## **BIRTHS 2005**

### **Slide 1:**

Introduction of *Massachusetts Births 2005*

### **Slide 2: Outline**

- I. Overview of 2005 Births and Comparison with U.S. indicators
- II. Birth Trends
- III. Selected Maternal Characteristics
- IV. Infant & Fetal Mortality
- V. Cesarean Section (C-Section) Deliveries
- VI. Teen Births
- VII. Selected Communities
- VIII. Summary

### **Slide 3: Title Page**

Overview of 2005 Births and Comparison with U.S. Births

### **Slide 4: 2005 Massachusetts Birth Characteristics**

On an average day in Massachusetts in 2005 there were:

- 210 births (76,824)
- 68 Cesarean deliveries (24,732)
- 19 Preterm births (<37 weeks gestation) (6,925)
- 10 multiples. Three sets of quadruplets in 2005 (3,565)
- 1 infant death (death of a child under the age of 1) (391)
- 12 teen births (women ages 15-19) There were 59 births to women < 15 (4,598)
- 16 births to mothers with inadequate prenatal care (13,000) , and
- 17 low birthweight infants (<5.5 pounds or 2500 grams) (6,073)

### **Slide 5: A Comparison of 2005 Birth Indicators Massachusetts v. U.S.**

In 2005, Massachusetts birth indicators were better than the United States including:

- fertility rate (significantly lower)
- teen birth rate (significantly lower)
- IMR (significantly lower) The U.S. rate is for 2004 because the final 2005 is not yet available.
- % smoking during pregnancy

In 2005, Massachusetts birth indicators were worse than the United States including:

- % receiving prenatal care in the first trimester (slightly, but significantly lower)
- % C-section (significantly higher) (both are at all time highs.)

Please note that asterisks on this slide and throughout this presentation denote statistical significance --- I will focus on outcomes that in which the differences are statistically significantly

### **Slide 6: Title Page**

Birth Trends in Massachusetts

### **Slide 7: Massachusetts Births 1995 & 2005**

To summarize important changes over the last 11 years, between 1995 and 2005:

- The number of births has declined significantly by 6% since 1995
- Massachusetts has had success in lowering the
  - teen birth rate, 21.7 (significantly lower by 28% from 1995)
  - smoking during pregnancy, 7.2% (significantly lower by 47% from 1995)

No statistically significant change in the IMR in this time period

Other indicators are not trending well:

- The %LBW, 7.9%, is up significantly by 23% since 1995
- %C-section deliveries 32%, is up significantly by 57%
- And % multiple births (up significantly by 44%) since 1995.

We will examine these indicators in more detail later in this presentation.

### **Slide 8: Joinpoint Analysis (JPA)**

- A trend analysis tool developed by the National Cancer Institute
- Creates a “model” (graph) that best describes the trend in events
- Points where the trend turns around are called “joinpoints”
- Shows the Annual Percentage Change (APC) for each line segment in the model

### **Slide 9: Trend in the Number of Births Massachusetts: 1990-2005**

This chart shows the trend in the number of births in Massachusetts from 1990 to 2005 using JPA.

APC– Annual Percent Change

- The blue squares are the number (1000s) of births in Massachusetts from 1990 to 2005.
- The linear regression (straight line) trend is shown by the red line
- Joinpoint analysis shows two points of change in the trend.
- The first change in the trend came in 1996, when the trend went from decreasing at about 2% per year to being stable between 1996-2002
- The second change in the trend was in 2002, when the trend changed to decreasing by 2% per year.

An overall population decrease since 2000 explains most of the decline in the APC in the last segment.

**Slide 10: Number of Births by Mother's Age (< 30 and 30+), Massachusetts: 1980-2005**

Another continuing trends is the increase in the number of women over the age of 30 giving birth since 1980.

- In 1980, 1 in 4 Massachusetts births was to a woman aged 30 and older
- while in 2005, almost 3 out of 5 births (55%) was to a woman aged 30 and older. Mothers 30 and over have made up the largest proportion of mothers since 1996.
- This increase is correlated with the increase in LBW and other factors that we will examine later.

**Slide 11: Age-specific Birth Rates, Massachusetts vs. U.S.: 2005**

Looking more closely at age-specific births you can see on this graph that the distribution of mother's age in Massachusetts differs with that of the U.S. in 2005. Massachusetts mothers tend to be older than those in the United States.

- The largest number of women giving birth in Massachusetts in 2005 was in the 30-35 age group.
- Whereas, the largest number of women giving birth in the U.S. in 2005 were in the 25-29 age group

**Slide 12: Percent of Births by Race and Hispanic Ethnicity Massachusetts: 1990-2005**

Another trend in Massachusetts is the increasing diversity in our state as reflected by births. In 1990, 22% of all births were to non-white or Hispanic mothers; in 2005, 30% of all births were to non-white or Hispanic women (or 19,977 out of 92,460 were non-white or Hispanic) vs. in 2005 (23,355 out of 76,824 births)

**Slide 13: Percent Non-U.S. Born Mothers Massachusetts: 1990-2005**

Population growth and our diversity is also represented by the increase in the percentage of foreign born mothers: In 1990, 1 out of 7 births was to a foreign born mother whereas, in 2005, more than 1 out of 4 births was to a foreign born mother (26.1%).

- You can see that from 1995 (the joinpoint), the number of births to Non-US born mothers rose by more than 5% per year.

Here, the blue bars represent the proportion of births to mothers born outside the US from 1990-2005. NOTE: US Born includes PR and US Territories.

#### **Slide 14: Births by Selected Mothers' Ethnicities**

From the Mother's ancestry data that is collected on the birth certificate, we can see more detail and our increasing diversity, for example,

- The number of Brazilian births has increased 99% in the past 6 years.
- The number of African births has increased 74%.
- Salvadoran births are up +42% from 2000.

These groups when combined, make up only about 6% percent of Massachusetts births overall.

#### **Slide 15: Number of Multiple Births, Massachusetts: 1990-2005**

Another important trend in Massachusetts is the increase in multiple births.

- In 1990, 1 out of 38 births was a multiple (2.7%);
- whereas, in 2005, about 1 out of every 22 births was a multiple (4.6%).
- This change has had an enormous impact on the rise in LBW, which we will examine later.
- This red line shows the trends in the number of multiple births.
  - The first change in the trend came in 1995, when the trend went from increasing at 2% per year to a dramatic increase of 8% per year until 1998.
  - In 1998, the trend slowed to increasing at about 4% per year.
  - The third change in the trend came in 2002, when the trend turned around to decreasing at about 2% per year.

#### **Slide 16: Low Birthweight (<2500g or 5.5lbs), Massachusetts: 1990-2005**

- This graph shows the increasing trend in low birthweight (LBW) percent since 1990. Low Birthweight is defined as weighing less than 2500 grams (5.5 pounds)
- Using Joinpoint analysis, we see a linear trend with LBW percent increasing about 2% per yr--as shown by the red line
- LBW is associated with poor infant outcomes such as Infant mortality as we will see in later slide.

#### **Slide 17: Low Birthweight Adjusted by Plurality, Massachusetts: 1990-2005**

In this graph we look at what the percent of low birthweight (LBW) would be if the proportion of multiples births had remained the same as it was in 1990 (5.8%).

- The red line shows the increasing trend in the percent of LBW, which we saw in an earlier slide.



- The blue dotted line shows how much lower the percent LBW is when we adjust for multiple births = 52%

In 2005, 52% of the increase in LBW is due solely to the increase in the proportion of multiples births!

### **Slide 18: Title Page**

Selected Maternal Characteristics

### **Slide 19: Births by Race and Hispanic Ethnicity Massachusetts: 2005**

This slide shows the distribution of births by mother's race and Hispanic ethnicity in 2005:

- In 2005, for the 1st time, less than 70% of births were to white non-Hispanic mothers ( in 1990, it was 80% WNH)
- Black non-Hispanic births made up 8%
- Hispanic births were 13% (up from 9% in 1990)
- And Asian and Pacific Islander births were 7%, (up from 4% in 1990)

The decline in the number of births overall was mostly due to a decline in white non-Hispanic births.

### **Slide 20: Birth Characteristics by Maternal Education Massachusetts: 2005**

Here, we see that birth indicators vary by mother's education.

- Least educated = less than a high school education (yellow bars). And most educated = a college degree or more (red bars)
- The least educated mothers are more likely to:
  - smoke during pregnancy
  - are 3 times more likely to receive publicly financed prenatal care
- These mothers are also less likely to:
  - have Cesarean deliveries
  - have multiple births
  - to breastfeed their newborns
  - receive adequate prenatal care.
- Note asterisks denote statistical significance

### **Slide 21: Birth Characteristics by Funding Source of Prenatal Care, Massachusetts: 2005**

Overall in Massachusetts, about 1 in 4 mothers (24.2%) had her prenatal care financed by Medicaid/MassHealth.

Mother's whose PNC funding source was Medicaid and not private insurance were:

- more likely to be young mothers <18
- more likely to have LBW infants
- more likely to be unmarried
- They were less likely to receive adequate prenatal care
- less likely to intend to breastfeed
- and less likely to have a C-section delivery.

**Slide 22: Title Page**

Infant & Fetal Mortality

**Slide 23: Infant Mortality Rate, Massachusetts: 1990-2005**

The blue line shows the Infant Mortality Rate (deaths per 1,000 live births) from 1990 to 2005.

- In 1990, the IMR was 7.0 (deaths per 1000 live births)
- and in 2005, the IMR was 5.1, which is 27% lower than the 1990 rate (deaths per 1000 live births)
- The red line shows the joinpoint analysis of the trend in IMR since 1990
- From 1990 to 1996, the IMR declined significantly at 5% per year
- then after 1996, the rate has been stable

**Slide 24: IMR by Race & Hispanic Ethnicity Massachusetts: 1990-2005**

This graph shows the persistent disparities in IMR by race and Hispanic ethnicity. Because of small numbers, the Asian IMR is not shown (it is lower than White non-Hispanics)

- The purple line is the White non-Hispanic IMR
- The blue line is the Hispanic IMR, which is the 2<sup>nd</sup> highest of all groups.
- The green line is the Black non-Hispanic IMR, which is the highest of all groups: more than twice as high as the white non-Hispanic IMR

**Slide 25: Black Non-Hispanic IMR Massachusetts: 1990-2005**

The joinpoint analysis shows 3 changes in the trend of the black non-Hispanic IMR from 1990 to 2005:

The trend has gone up and down, and most recently the trend has been declining.

- From 1990 to 1992- increased by 7% per year

- Between 1992-1995- declined by 11% per year
- Between 1995-2003- increased by 2% per year
- And since 2003, it has been declining by 13% per year

**Slide 26: Black Non-Hispanic IMR with Linear Trend, Massachusetts: 1990-2005**

If we just looked at the overall, linear trend in Black infant mortality from 1990 to 2005 shown here by the red line, we see a decline of about 2% per year.

**Slide 27: Hispanic IMR, Massachusetts: 1990-2005**

The Hispanic IMR shows a different pattern:

- The trend declined significantly between 1990 and 1999 at about 6% per year
- and has been increasing at about 5% ever since
- This recent increase must be closely monitored.

**Slide 28 : Infant Mortality Rate, Effect of Excluding <500g (1.1lb) Infants1 Massachusetts: 1997-2005**

- This graph of the IMR from 1997 to 2005 illustrates the role that extremely low birthweight plays in the IMR.
- Infants born weighing less than 500 grams, or about 1.1 pound, have a very low survival rate (less than 10%), and, therefore, they contribute a large amount to the infant mortality rate.
- The recalculated IMR excluding the these extremely low birth weight infants is 46% lower than if all infant deaths are counted.
- The top (pink) line is the standard IMR, which includes deaths of infants of all weights.
- The second (blue-dashed) line shows the effect on the IMR of excluding infants whose weight is less than 500 grams.
- Low Birthweight is influenced by several factors including: Mother's age and multiple births.

**Slide 29: Infant & Fetal Mortality Rate, Massachusetts: 1998-2005**

*Fetal Death: A stillbirth delivered, extracted or expulsed at 20 weeks gestation or more or weighing 350 grams or more.*

- The lines show infant, fetal, and combined feto-infant death rates.
- There are approximately the same number of fetal deaths as infant deaths and it is important to track all these event in the perinatal period.

- The red line on the bottom is the infant death rate (as distinguished from the infant mortality rate)
- The fetal mortality rate is shown in blue. It has been consistently somewhat higher than the infant death rate, but the two rates nearly converged in 2002, when they were 4.5 infant mortality and 4.6 fetal mortality.
- The combined feto-infant mortality rate is the sum of the fetal and infant rates.

### **Slide 30: Title Page**

Deliveries by Cesarean Section

### **Slide 31: Infants Delivered by C-Section, Massachusetts and the U.S.: 1990-2005**

- In Massachusetts, the percent of deliveries that are cesarean has been higher than that of the U.S. since 1998, and in 2005, it is about 7% higher than the U.S. rate. Both are historically the highest percentage ever. Massachusetts has the 11<sup>th</sup> highest c-section rate in the country according to the latest statistics available.
- First, a comparison of Massachusetts and U.S. trends since 1990:
- The blue line shows the percentage of infants delivered by C-section for the United States.
- The purple line shows the Massachusetts trend, which was below the U.S. in the early nineties

### **Slide 32: Infants Delivered by C-Section, Massachusetts: 1990-2005**

Now, we will look at the Massachusetts C-section rate from 1990 to 2005 more closely:

- The joinpoint analysis shows a significant change in the C-section trend in 1997.
- Before that, the C-section rate had been decreasing significantly by about 2% per year.
- After 1997, the Massachusetts C-section rate has been increasing significantly at the rate of about 7% per year.

### **Slide 33: Title Page**

Teen Births

### **Slide 34: Births to Teens (15-19 years), Massachusetts and U.S.: 2005**

The teen birth rate in MA is a little over 1/2 that of the US.

In MA in 2005, 1 out of 17 births was to a teen (15-19)—significantly lower than the US rate.

When we look at the teen birth rate by race and ethnicity, we see that:

- The white non-Hispanic teen birth rate is more than 50% lower than that of the U.S.
- The black non-Hispanic teen birth rate is about 30% lower
- No significant differences in the Hispanic or Asian teen birth rates compared with those of the U.S.

**Slide 35: Teen Birth Rates for Massachusetts and U.S. - 1985-2005**

- The blue line shows the U.S. teen birth rate since 1985, and the purple line shows the Massachusetts teen birth rate.
- Teen birth rates in U.S. have been consistently higher than Massachusetts teen birth rates (almost twice the Massachusetts average).

**Slide 36: Teen Birth Rates, Massachusetts: 1985-2005**

- Trend analysis of teen birth rates from 1985 to 2005 shows that there was a significant change in the teen birth rate in 1990.
- Before that, the rate had been *increasing* significantly at about 6% per year
- And after 1990, the trend has been *decreasing* significantly at about 4% per year.

From its high in 1989 (35.9), the teen birth rate for Massachusetts has declined 40%.

**Slide 37: Highest Teen Birth Rates (Among Communities with at Least 75 Teen Births) Massachusetts: 2005**

This slide shows the communities with the highest teen birth rates in the state in 2005 among the communities with at least 75 teen births.

- Although the teen birth rate remains low for the state, certain communities in Massachusetts continued to have teen birth rates that are substantially higher than the state rate in 2005. In 2005, all these communities had teen birth rates significantly higher than the state rate of 21.7 births to females 15-19 per 1,000 females ages 15-19
- However, as you can see, all these communities made significant progress over the last 11 years. Asterisks here denote statistically significant declines in rates between 1995 and 2005.

**Slide 38: Teen Birth Rates by Executive Office of Health and Human Services (EOHHS) Regions Massachusetts: 2005**

Here is a map of Massachusetts showing teen birth rates by the EOHHS Regions in 2005:

- Red– statistically significantly higher than state
- Green-statistically significantly lower than state
- Yellow – no different from the state rate.

The highest teen birth rates were in the Western and Boston Regions of the state.

**Slide 39: Title Page**

Birth Outcomes for Selected Communities

**Slide 40: Highest Infant Mortality Rates, Among the 30 Largest Communities1 Massachusetts: 2005**

- These are the highest IMRs for 2005 for Massachusetts largest communities.
- Among the largest municipalities, two communities had 2005 infant mortality rates (IMR) statistically higher than the state IMR: Springfield (10.6) and Worcester (13.9 deaths per 1,000 live births).

**Slide 41: Infant Mortality Rates, Springfield: 1990-2005**

As you can see the infant mortality rate in Springfield fluctuates from year to year. In 2004, there was 15 infant deaths; in 2005, there was 25. This increase was not statistical significant.

**Slide 42: Infant Mortality Rates, Worcester: 1990-2005**

The infant mortality rate in Worcester has fluctuated from year to year since 1990. In 2004 there were 17 infant deaths and in 2005, 36. This increase is not statistical significant.

**Slide 43: Percent of Mothers Receiving Adequate Prenatal Care for 30 Largest Communities, Massachusetts: 2005**

Other birth characteristics vary by community. In this slide, you can see differences in adequacy of prenatal care. Adequacy of prenatal care is determined by two components: the month that prenatal care was begun, and the number of prenatal care visits. It does not measure the *quality* of care.

- Disparities in the percentages of mothers receiving adequate prenatal care exist across communities.
- Brookline and Cambridge had the best % adequate PNC
- while, Pittsfield and Lowell had the worst.

#### **Slide 44: Percent Low Birthweight for 30 Largest Communities, Massachusetts: 2005**

- The community with the best (i.e., lowest) percent of LBW was Leominster– This is the first year that the population of Leominster is large enough to be included among the 30 largest communities.
- And those with the worst percent of LBW (i.e., the highest) were Brockton, Revere, New Bedford, and Springfield.
- Asterisks denote statistically significance differences from the STATE average.

#### **Slide 45: Summary – Successes**

To summarize in 2005 most perinatal indicators for Massachusetts are good and getting better over time.

- Massachusetts birth indicators for 2005 compare very well to U.S. indicators. Massachusetts has been consistently one of the best states in the nation.
- The teen birth rate continues to decline, and the decline is among all race/ethnicity groups
- Fewer women smoke during pregnancy each year;
- And, 85% of women receive adequate prenatal care

#### **Slide 46: Summary– Challenges**

Need to monitor trends in:

- Low birthweight infants
- Preterm births
- Multiple births
- C-Section deliveries

In 2005, slightly up-tick from 2004 (5.1 vs.4.8 infant death/1000 live births) and increase in IMR for selected communities.

#### **Slide 47: Summary– Disparities Persist by Race, Geography, and SES**

Disparities persist by race/ethnicity, education and community:

- The black non-Hispanic IMR is twice as high as the white non-Hispanic IMR.
- The teen birth rate for Hispanics was almost 6 times that for white non-Hispanics.
- Cambodian (55.1%), Central American (65.0%), and many African (66.9%) mothers were less likely to receive prenatal care in their first trimester .

- Low birthweight rates in Brockton, Revere, and New Bedford are at least 2 times the statewide rate.
- Less educated women were more likely to smoke during their pregnancies, more likely to deliver low birthweight infants, and less likely to receive adequate prenatal care.

#### **Slide 48: Infant Mortality Rate, Massachusetts: 1842-2005**

This slide shows IMR from 1842-2005. We are indeed fortunate in Massachusetts to be able to collect and use information such as this to guide our policies and identify areas for intervention.

We need to recognize the importance of the data just presented (i.e. birth certificate data) for development of programs such as newborn screening, high-risk infant identification and immunization tracking as well as for research and surveillance. It is extremely important that all physicians, other medical professionals, and hospital administrators sustain their efforts to provide timely data of the highest quality.

The Registry of Vital Records and Statistics plays a critical role in the collection of birth information. Their work provides the basic information that guides many public health initiatives.

This graph of IMRs in Massachusetts over time shows that we have been collecting data and calculating IMRs since 1842 --the data were important then, and they continue to be as important as ever today.

#### **Slide 49: How Can You Access the Massachusetts Births 2005 Report?**

Hard copies of Massachusetts Births 2005 are available by calling the numbers:

- Hard Copies: (617) 740-2670
- TDD/TTY: (617) 624-6001

An electronic copy of Massachusetts Births 2005 and this presentation can be downloaded from the DPH web site as of today.

#### **Slide 50: Accessing Massachusetts Births 2005 Data on MassCHIP**

MassCHIP is the Department's free on-line interactive data dissemination system. It is a source for vital statistics data and 28 other major databases; much of the data presented today are available in MassCHIP for years going back to 1989 to allow users to examine trends at both the state and community level.

#### **Slide 51: Thank you.**